WEST Search History

DATE: Wednesday, February 05, 2003

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L1	phytostanol ester	5	L1
L2	phytosterol ester	18	L2
L3	l1 and L2	4	L3
L4	L1 and (polyunsaturated fatty acid)	0	L4
L5	L1 and (unsaturated fatty acid)	2	L5
L6	L2 and (unsaturated fatty acid)	7	L6

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☐ 1. Document ID: US 6441206 B1

L2: Entry 1 of 18 File: USPT Aug 27, 2002

DOCUMENT-IDENTIFIER: US 6441206 B1
TITLE: Use of organic acid esters in dietary fat

Detailed Description Text (111):
The phytosterol esters were added to the product dissolved in cooking oil; the reference-sample is according to the basic recipe.

CLAIMS:

12. A method of preparing phytostanol derivatives comprising: preparing a phytosterol ester by esterification of a phytosterol with phytosterol hydroxy acid, keto acid, dicarboxylic acid or amino acid ester; hydrogenating said phytosterol ester in a concentrated ethanol or acetic acid solution to form a hydrogenation solution containing phytostanol derivatives.

13. A method according to claim 12, wherein the phytosterol ester is prepared with succinic acid, maleic acid, glutaric acid, keto glutaric acid, tartaric acid, malic acid, citric acid, lactic acid, 3(R)-hydroxy butyric acid or an amino acid derivable from proteins.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

☐ 2. Document ID: US 6388069 B1

L2: Entry 2 of 18 File: USPT May 14, 2002

DOCUMENT-IDENTIFIER: US 6388069 B1
TITLE: Corn fiber for the production of advanced chemicals and materials:arabinoxylan and arabinoxylan derivatives made therefrom

Brief Summary Text (18):
Rice bran has been reported to contain approximately 18 wt. % extractable oil. Of this amount, 0.1 to about 0.8 wt. % comprises a ferulate ester, meaning that rice bran, at most, contains only about 0.08 wt. % ferulate ester. Moreover, the phytosterol esters in rice bran oil are primarily gamma-oryzanols, which are believed to be less effective as hypocholesterolemics.

Brief Summary Text (20):
A recent patent, U.S. Pat. No. 5,843,499, discloses the extraction of corn fiber oil

from finely ground corn fiber by utilizing either hexane or supercritical CO.sub.2 as a solvent, with hexane being preferred. In this reference, the degree of grinding was demonstrated to be critical in determining the amount of oil obtained from the corn fiber, with a finer grinding of the corn fiber resulting in a greater amount of oil extracted. Drying of the corn fiber was also found to be highly significant to the invention, presumably because when the corn fiber is wet, the hexane extractant will not adequately penetrate the fiber so as to allow satisfactory extraction. However, because a drying step is expensive and time consuming on an industrial scale, it would be highly beneficial to be able to extract phytosterol esters from corn fiber directly without the need for an additional drying step.

Drawing Description Text (4):
FIG. 3 shows the Carbon 13 NMR spectra of phytosterol ester isolated from destarched corn fiber oil.

Detailed Description Text (11):
In a first major embodiment, the invention pertains to the separation of a corn fiber lipid fraction having phytosterol esters and phytosterols wherein the method comprises the steps of: a) heating an aqueous mixture of unground corn fiber; b) contacting the mixture of step (a) with at least one enzyme suitable for digesting starch for a time and at a temperature suitable to provide a mixture of an essentially destarched corn fiber and a liquid comprising soluble carbohydrates; c) contacting the mixture of step (a) or (b) with a protease enzyme to provide a proteolyzed corn fiber and a liquid; d) separating the liquid of step (c) from the corn fiber, thereby providing destarched, proteolyzed corn fiber; and e) extracting the destarched, proteolyzed corn fiber with at least one organic solvent, thereby providing a corn fiber lipid fraction/organic solvent solution having phytosterol esters and phytosterols.

Detailed Description Text (12):
In a further preferred embodiment, the invention pertains to the separation of a novel corn fiber lipid fraction having phytosterol esters and phytosterols wherein the method comprises the steps of: a) providing a mixture of corn fiber and water; b) contacting the mixture with a protease enzyme to provide a proteolyzed corn fiber and a liquid; c) separating the liquid from the proteolyzed corn fiber; and d) extracting the proteolyzed corn fiber with at least one organic solvent, thereby providing a corn fiber lipid fraction/organic solvent solution having phytosterol esters and phytosterols.

Detailed Description Text (27):
Further, it has been unexpectedly found that treatment of corn fiber with a protease enzyme provides for a more efficient extraction of total corn fiber oil with a different distribution of phytosterols and phytosterol esters than is observed with corn fiber which has not been treated with a protease enzyme. Without wishing to be bound by theory, it is believed that the protease also functions as an esterase, thereby cleaving certain ester linkages and allowing the more efficient extraction of the lipid fraction from the corn fiber.

Detailed Description Text (28):
Significantly, it has been found that subjecting corn fiber to a protease enzyme contacting step provides a corn fiber oil of a different, and novel, composition over that corn fiber oil disclosed in U.S. Pat. No. 5,843,499 to Moreau, et al. Particularly, it has been found that corn fiber oil extracted from proteolyzed corn fiber contains a different distribution of phytosterols and phytosterol esters than the oil obtained by Moreau et al. Accordingly, in one embodiment, the invention pertains to the product obtained by the corn fiber oil extraction processes herein. In yet another embodiment, the invention pertains to a novel corn fiber oil in which the concentration of phytosterols in the lipid fraction is at least about 1.4 times greater than the concentration of phytosterols in the lipid fraction of nonproteolyzed corn fiber. Still yet, the invention pertains to a novel corn fiber oil in which the concentration of phytosterol esters (or phytosterol ferulates) in the lipid fraction is at least about 1.4 times less than the concentration of phytosterol esters (or phytosterol ferulates) in the lipid fraction of nonproteolyzed corn fiber.

Detailed Description Text (36):
Following the solvent extraction step, the solvent is generally removed from the corn fiber lipid fraction by distillation. In the case were a polar organic solvent with limited water solubility is used for extraction of wet corn fiber, any water layer that may develop can be decanted either before or after the distillation. An example of such an organic solvent with limited water miscibility is EtOAc. When high vacuums (about 0.05 to about 10 mm Hg) and temperatures (about 50.degree. C. to about 200.degree. C.) are coupled with the appropriated equipment, such as falling film or wiped film evaporators, the organic solvent can be removed from the lipid fraction and the lipid fraction can be enriched in phytosterols and phytosterol esters.

Detailed Description Text (37):
A preferred method for separating the phytosterols and phytosterol esters is by crystallization. If desired, unwanted components such as glyceride esters can be separated from the corn fiber lipid fraction by extraction, thereby providing a lipid fraction enriched in phytosterol esters and phytosterols from which the phytosterol esters and phytosterols can be crystallized. In one embodiment unwanted components in the corn fiber lipid fraction are any components not consisting of phytosterols and/or phytosterol esters. Yet further, unwanted components can be removed from the corn fiber lipid fraction by hydrolysis of glyceride esters followed by removal of the hydrolyzed compounds to provide a lipid fraction enriched in phytosterol esters and phytosterols. The phytosterol esters and phytosterols can be isolated from this enriched lipid fraction by crystallization. One of ordinary skill in the art will recognize the methods that may be utilized to perform such separations.

Detailed Description Text (38):
As noted, the corn fiber lipid fraction is preferably separated from the organic solvent solution. Preferably, the organic solvent is separated from the corn fiber lipid fraction via distillation. A preferred distillation method is vacuum distillation. By this preferred vacuum distillation method, the corn fiber lipid fraction may be enriched in phytosterols and phytosterols esters. The corn fiber lipid fraction may be separated from the organic solvent in a distillation process wherein the phytosterols and phytosterol esters are separated with the corn fiber lipid fraction. By "separated with" it is meant that the phytosterols and phytosterol esters are present in the corn fiber lipid fraction.

Detailed Description Text (39):
It is further preferable that the phytosterols and phytosterol esters are separated from the corn fiber lipid fraction in a mixture or as individual fractions. When the phytosterols and phytosterol esters are separated as a mixture, the phytosterols may optionally be separated from the phytosterol esters to provide two fractions: one fraction consisting essentially of a phytosterol and one fractoin consisting essentially of a phytosterol ester.

Detailed Description Text (41):
In a further embodiment, the invention comprises obtaining a yield of corn fiber oil of at least 1.0% as measured by dry weight of corn fiber. In a preferred embodiment, the corn fiber oil is obtained in a yield of about 1.0 wt. % to about 7.0 wt. % based on the dry weight of corn fiber. In a still further preferred embodiment, the corn fiber oil is obtained in a yield of about 3 wt. % to about 5 wt. % based on the dry weight of corn fiber. Still further, the amount of corn fiber oil extracted is from about 2 wt. % to about 3.5 wt. %. The methods herein provide enhanced yields of total extractable corn fiber oil, as well as enhanced yields of phytosterol esters and phytosterols in the corn fiber oil relative to those disclosed in the prior art.

Detailed Description Text (42):
Yet another embodiment comprises conducting at least one additional solvent extraction step, wherein the corn fiber lipid fraction/organic solvent solution from a previous solvent extraction step is reused in the additional solvent extracting step, thereby providing an increasingly concentrated corn fiber lipid fraction/organic solvent solution having phytosterols and phytosterol esters. In this preferred embodiment, organic solvent containing corn fiber oil is recycled for subsequent extractions. The oil becomes inceasingly more concentrated with each pass which results in an overall higher concentration of corn fiber oil in the final corn fiber oil/solvent solution. The number of additional extraction steps may range from

about 1 to about 100, more preferably from about 2 to about 10. In a particularly preferred embodiment, this solvent recycling step is utilized in conjunction with a continuous extraction process. One of ordinary skill in the art will recognize that such methods greatly improve the industrial applicability of the extraction of corn fiber oil from corn fiber.

Detailed Description Text (43):
In a further aspect, the invention provides a method of extracting a corn fiber lipid fraction having phytosterols and phytosterol esters wherein the method comprises the steps of: a) providing a mixture of unground corn fiber and water; b) separating the liquid from the corn fiber, thereby providing a water wet corn fiber; and c) extracting the water wet corn fiber with at least one polar organic solvent, thereby providing a corn fiber lipid fraction/polar organic solvent solution having phytosterol esters and phytosterols. In this preferred method, corn fiber utilized to obtain corn fiber oil is not treated with a protease enzyme prior to solvent extraction. Still further preferred, the corn fiber is unground. Still preferably, the corn fiber is water wet, wherein the water wet corn fiber contains from about 15 wt. % to about 85 wt. % water based on dry weight of the corn fiber. Yet further preferred, the corn fiber is water wet, wherein the water wet corn fiber contains from about 25 wt. % to about 65 wt. % water based on dry weight of the corn fiber. Since the corn fiber in this embodiment is wet, it is critical to utilize polar organic solvent for the extraction.

Other Reference Publication (9):
Moreau et al., "The Occurrence and Biological Activity of Ferulate-Phytosterol Esters in Corn Fiber and Corn Fiber Oil," U.S.D.A., 189-191 (1988).

CLAIMS:

11. The method of claim 1, wherein prior to the alkaline extractant contacting step the proteolyzed corn fiber is contacted with at least one organic solvent to extract a corn fiber oil from the corn fiber, thereby providing a corn fiber lipid fraction/organic solvent solution having phytosterol esters and phytosterols.

☐ 3. Document ID: US 6352845 B1

L2: Entry 3 of 18 File: USPT Mar 5, 2002

DOCUMENT-IDENTIFIER: US 6352845 B1
TITLE: Corn fiber for the production of advanced chemicals and materials: separation of monosaccharides and methods thereof

Brief Summary Text (18):
Rice bran has been reported to contain approximately 18 wt. % extractable oil. Of this amount, 0.1 to about 0.8 wt. % comprises a ferulate ester, meaning that rice bran, at most, contains only about 0.08 wt. % ferulate ester. Moreover, the phytosterol esters in rice bran oil are primarily gamma-oryzanols, which are believed to be less effective as hypocholesterolemics.

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A recent patent, U.S. Pat. No. 5,843,499, discloses the extraction of corn fiber oil from finely ground corn fiber by utilizing either hexane or supercritical CO.sub.2 as a solvent, with hexane being preferred. In this reference, the degree of grinding was demonstrated to be critical in determining the amount of oil obtained from the corn

fiber, with a finer grinding of the corn fiber resulting in a greater amount of oil extracted. Drying of the corn fiber was also found to be highly significant to the invention, presumably because when the corn fiber is wet, the hexane extractant will not adequately penetrate the fiber so as to allow satisfactory extraction. However, because a drying step is expensive and time consuming on an industrial scale, it would be highly beneficial to be able to extract phytosterol esters from corn fiber directly without the need for an additional drying step.

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Detailed Description Text (12):
In a further preferred embodiment, the invention pertains to the separation of a novel corn fiber lipid fraction having phytosterol esters and phytosterols wherein the method comprises the steps of: a) providing a mixture of corn fiber and water; b) contacting the mixture with a protease enzyme to provide a proteolyzed corn fiber and a liquid; c) separating the liquid from the proteolyzed corn fiber; and d) extracting the proteolyzed corn fiber with at least one organic solvent, thereby providing a corn fiber lipid fraction/organic solvent solution having phytosterol esters and phytosterols.

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Detailed Description Text (39):
It is further preferable that the phytosterols and phytosterol esters are separated from the corn fiber lipid fraction in a mixture or as individual fractions. When the phytosterols and phytosterol esters are separated as a mixture, the phytosterols may optionally be separated from the phytosterol esters to provide two fractions: one fraction consisting essentially of a phytosterol and one fraction consisting essentially of a phytosterol ester.

Detailed Description Text (41):
In a further embodiment, the invention comprises obtaining a yield of corn fiber oil of at least 1.0% as measured by dry weight of corn fiber. In a preferred embodiment, the corn fiber oil is obtained in a yield of about 1.0 wt. % to about 7.0 wt. % based on the dry weight of corn fiber. In a still further preferred embodiment, the corn fiber oil is obtained in a yield of about 3 wt. % to about 5 wt. % based on the dry weight of corn fiber. Still further, the amount of corn fiber oil extracted is from about 2 wt. % to about 3.5 wt. %. The methods herein provide enhanced yields of total extractable corn fiber oil, as well as enhanced yields of phytosterol esters and phytosterols in the corn fiber oil relative to those disclosed in the prior art.

Detailed Description Text (42):
Yet another embodiment comprises conducting at least one additional solvent extraction step, wherein the corn fiber lipid fraction/organic solvent solution from a previous solvent extraction step is reused in the additional solvent extracting step, thereby providing an increasingly concentrated corn fiber lipid fraction/organic solvent solution having phytosterols and phytosterol esters. In this preferred embodiment, organic solvent containing corn fiber oil is recycled for subsequent extractions. The oil becomes increasingly more concentrated with each pass which results in an overall higher concentration of corn fiber oil in the final corn fiber oil/solvent solution. The number of additional extraction steps may range from about 1 to about 100, more preferably from about 2 to about 10. In a particularly preferred embodiment, this solvent recycling step is utilized in conjunction with a continuous extraction process. One of ordinary skill in the art will recognize that

such methods greatly improve the industrial applicability of the extraction of corn fiber oil from corn fiber.

Detailed Description Text (43):
In a further aspect, the invention provides a method of extracting a corn fiber lipid fraction having phytosterols and phytosterol esters wherein the method comprises the steps of: a) providing a mixture of unground corn fiber and water; b) separating the liquid from the corn fiber, thereby providing a water wet corn fiber; and c) extracting the water wet corn fiber with at least one polar organic solvent, thereby providing a corn fiber lipid fraction/polar organic solvent solution having phytosterol esters and phytosterols. In this preferred method, corn fiber utilized to obtain corn fiber oil is not treated with a protease enzyme prior to solvent extraction. Still further preferred, the corn fiber is unground. Still preferably, the corn fiber is water wet, wherein the water wet corn fiber contains from about 15 wt. % to about 85 wt. % water based on dry weight of the corn fiber. Yet further preferred, the corn fiber is water wet, wherein the water wet corn fiber contains from about 25 wt. % to about 65 wt. % water based on dry weight of the corn fiber. Since the corn fiber in this embodiment is wet, it is critical to utilize polar organic solvent for the extraction.

Other Reference Publication (6):
Moreau et al., "The Occurrence and Biological Activity of Ferulate-Phytosterol Esters in Corn Fiber and Corn Fiber Oil," U.S.D.A. 189-191 (1998).

CLAIMS:

8. The method of claim 1, wherein prior to the alkaline extractant contacting step the proteolyzed corn fiber is contacted with at least one organic solvent to extract a corn fiber oil from the corn fiber, thereby providing a corn fiber lipid fraction/organic solvent solution having phytosterol esters and phytosterols.

☐ 4. Document ID: US 6352737 B1

L2: Entry 4 of 18 File: USPT Mar 5, 2002

DOCUMENT-IDENTIFIER: US 6352737 B1
TITLE: Use of nanoscale sterols and sterol esters

Brief Summary Text (3):
Another important property of phytosterols and, above all, of phytosterol esters is their hypocholesterolemic effect, i.e., their ability after oral ingestion, for example as a margarine additive, to significantly reduce cholesterol levels in the blood. This property was described as long ago as 1953 (Peterson, et al., J. Nutrit. Vol. 50, p. 191 (1953)). U.S. Pat. Nos. 3,089,939 and 3,203,862, in addition to German Patent Publication No. DE 20 35 069 (Procter & Gamble), point in the same direction. The active substances are normally added to cooking oils or edible oils and are then taken up through the food. However, the quantities used are generally small and are normally below 0.5% by weight, to prevent the edible oils from clouding or the sterols from precipitating when water is added. The incorporation of sitostanol esters in margarine, butter, mayonnaise, salad creams and the like to reduce the blood cholesterol content is proposed in International Patent Publication No. WO 92/19640 (Raision). Reference is also made in this connection to German Patent Publication No. DE-A1 197 00 796 (Henkel).

Detailed Description Paragraph Table (2):
TABLE 2 Hypocholesterolemic effect Radioactivity [%-rel.] After After After After After Ex. Phytosterol(ester) 3 h 6 h 12 h 24 h 48 h C1 .beta.-Sitostanol* 93 83 75 50 32 C2 .beta.-Sitostanyl stearate* 90 80 71 44 26 1 Nano-.beta.-sitostanol** 88 77 69 44 27 2 Nano-.beta.-sitostany1 85 74 66 37 21 stearate*** *commercial products **acc. to Production Example 3 ***acc. to Production Example 5

CLAIMS:

3. The hypocholesteremic agent according to claim 1, wherein the at least one active substance is selected from the group consisting of nanoscale phytosterols and nanoscale phytosterol esters.

16. The edible composition according to claim 11, wherein the at least one active substance is selected from the group consisting of nanoscale phytosterols and nanoscale phytosterol esters.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
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☐ 5. Document ID: US 6316030 B1

L2: Entry 5 of 18 File: USPT Nov 13, 2001

DOCUMENT-IDENTIFIER: US 6316030 B1
TITLE: Use of nanoscale sterols and sterol esters

CLAIMS:

2. A. The composition of claim 1 wherein the nanoscale sterols and nanoscale sterol esters are phytosterols and their ester derivatives.

12. The process of claim 11 wherein the nanoscale sterols and nanoscale sterol esters are phytosterols and their ester derivatives.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw Desc | Image

☐ 6. Document ID: US 6254914 B1

L2: Entry 6 of 18 File: USPT Jul 3, 2001

DOCUMENT-IDENTIFIER: US 6254914 B1
TITLE: Process for recovery of corn coarse fiber (pericarp)

Brief Summary Text (3):
Corn coarse fiber (also known as pericarp or bran) is the outer covering of a kernel of corn, and is a product that can be used as feedstock for the production of such

end products as Corn Fiber Gum (CFG) and Corn Fiber Oil. Corn Fiber Gum can be used in both food and non-food applications as a film former, an emulsifier, a low-viscosity bulking agent, an adhesive, or as a substitute for gum Arabic. Corn Fiber Oil has three natural phytosterol compounds (ferulate phytosterol esters or "FPE," free phytosterols or "St," and phytosterol fatty acyl esters or "St:E") that have been found to lower serum cholesterol in blood, and therefore can be used as a nutraceutical product. Such products command high dollar values in the market (approximately $8.00 to 9.00 per pound).

☐ 7. Document ID: US 6171638 B1

L2: Entry 7 of 18 File: USPT Jan 9, 2001

DOCUMENT-IDENTIFIER: US 6171638 B1
TITLE: Production of isoflavone enriched fractions from soy protein extracts

Detailed Description Text (27):
The dry powder and added ingredient blended at 62 may also include food ingredients or the like. The food ingredient may be any in a group including sweetners, cocoa ingredients, starch, maltodextrin, animal protein, milk protein, soy flour, soy protein concentrate, plant and animal proteins, soy protein isolate, soy fiber, fluid lecithin, granular lecithin, polysaccharides, starches, fats and oils, phytosterols, phytosterol esters, phytostanols, phytostanol esters, mixed tocopherols, d,I-alpha tocopherol, sweetners and derivatives, lignans, catechins, carotenoids, d-alpha tocopherol, tocotrienols, and mixed thereof.

CLAIMS:

6. The process of claim 5, wherein the food ingredient is selected from the group consisting of sweetners, starch, maltodextrin, milk proteins, animal protein, soy flour, soy protein concentrate, soy protein isolate, and other edible proteins, soy fiber, fluid lecithin, granular lecithin, fats and oils, phytosterols, phytosterol esters, phytostanols, phytostanol esters, tocopherols, d,I-alpha tocopherol, d-alpha tocopherol, tocotrienols, lignans, catechins, carotenoids, and mixtures thereof.

9. The process of claim 8, wherein the at least one ingredient is selected from the group consisting of sweetners, starch, maltodextrin, milk protein, animal protein, soy flour, soy protein concentrate, soy protein isolate, and other edible proteins, soy fiber, fluid lecithin, granular lecithin, fats and oils, phytosterols, phytosterol esters, phytostanols, phytostanol esters, mixed tocopherols, d,I-alpha tocopherol, d-alpha tocopherol, lignans, catechins, carotenoids, tocotrienols and mixtures thereof.

61. The process of blending the product of claim 59 with a food ingredient selected from the group consisting of sweetners, starch, maltodextrin, milk proteins, animal protein, soy flour, soy protein concentrate, soy protein isolate, and other edible proteins, soy fiber, fluid lecithin, granular lecithin, fats and oil, phytosterols, phytosterol esters, phytostanols, phytostanol esters, tocopherals, d,I-alpha tocopherol, d-alpha tocopheral, tocotrienols, lignans, catechins, carotenoids, and mixtures thereof.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 8. Document ID: US 6162483 A

L2: Entry 8 of 18 File: USPT Dec 19, 2000

DOCUMENT-IDENTIFIER: US 6162483 A
TITLE: Fat compositions for use in food

Abstract Text (1):
Fatty acid esters, such as the unsaturated fatty acid esters of sterols and/or stanols, are used as a replacement for a substantial portion or all of the undesirable saturated and trans-unsaturated fats used as structure giving hardstocks in edible foods such as margarines mayonnaise, cooking oils, cheeses, butter and shortening. Because of the similarity in the crystallinity and physical properties of the esters to those of the undesirable hardstock fats, the substitution or replacement contributes favorably to the flavor, texture and other sensory properties of the foods. Only the fatty acid portion of the phytosterol esters defined herein as texturizing agent is digested or absorbed with the sterol part being unabsorbable, thereby resulting in a reduction in total caloric uptake. Furthermore, the phytosterol fatty acid esters reduce the absorption of both dietary and biliary cholesterol from the digestive tract, thereby lowering the blood serum cholesterol level, especially the LDL-cholesterol.

Brief Summary Text (13):
This invention is based on the surprising finding that stanol and sterol fatty acid esters, such as phytosterol esters, or their blends form crystal networks with similar properties as those of conventional hardstock triglycerides. This finding makes it possible to use these texturizing agents fully or partly as replacements for the conventional hardstock in fat blends to be used in fat-containing products, where the crystallizing fat of the hardstock is of prime importance to the overall sensoric quality.

Brief Summary Text (14):
A conventional fat blend comprises a liquid oil component and a solid fat component comprising a conventional hardstock. The present invention relates to a fat blend and an edible food containing such, including a reduced level of a conventional hardstock rich in absorbable saturated or a trans-unsaturated fat, wherein the solid fat component is composed of either fully a phytosterol ester or ester blend, defined herein as a texturizing agent, or of a blend of said texturizing agent and conventional hardstock. The obtained solid fat of the invention shows similar physical properties as conventional hardstocks and builds up in the final food product a crystal network with similar properties as the conventional hardstock.

Brief Summary Text (16):
The phytosterol esters defined herein as texturizing agents comprise unsaturated and saturated fatty acid esters of sterols or stanols as well as mixtures thereof. The term phytosterol is intended to mean saturated and unsaturated sterol alcohols and their blends derived from plants (plant sterols), as well as synthetically produced sterol alcohols and their blends having properties that replicate those of naturally occurring alcohols. These sterol alcohols are characterized by a common polycyclic steroid nucleus comprising a 17 carbon atom ring system, a side chain and a hydroxyl group. The nucleus is either saturated, wherein the sterol alcohol is referred to as a stanol, or unsaturated, wherein the sterol alcohol is referred to as a sterol. For purposes of the present invention, sterol is understood to mean a single sterol or blends of sterols, and stanol is understood to mean a singl stanol or blends of stanols.

Brief Summary Text (21):

For the purpose of this invention, solid fat is understood to mean the non-liquid part of the fat blend, crystallizing to form a crystal network and giving the end product the desired structural and sensoric properties. In this specification the solid fat is either composed wholly of a texturizing agent defined herein as a phytosterol ester or ester blends or of a blend of said texturizing agent and conventional hardstock. The composition and physical properties of the solid fat are tailor-made to give similar physical properties as conventional triglyceride-based hardstocks. The phytosterol esters can be prepared e. g. by the method described later in Example 1 of this specification. Conventional hardstock fats may be used as part of the solid fat and those skilled in the art are familiar with different compositions of usable hardstocks. It is therefore obvious for a person skilled in the art how to prepare the solid fat of the invention by practicing the teachings of this invention.

Detailed Description Text (4):
The advantages of using the stanol or sterol fatty acid esters for this purpose is that their physical properties can be tailor-made by changing the fatty acid composition. This is achieved by selecting a fatty acid which contributes the requisite melting point profile to the phytosterol ester. The carbon chain length of the fatty acid affects the melting point of the ester, i.e. melting points decrease with increasing molecular weight of the fatty acid until a minimum is reached at the C14-C16 region after which the melting points increase. Also a contributing factor is the degree of saturation or unsaturation of the fatty acid, with a greater degree of saturation being accompanied by a higher melting point.

Detailed Description Text (7):
It should be noted that the fat blends containing phytosterol ester used for lowering the cholesterol level disclosed in Example 5 of U.S. Pat. No. 5,502,045 were produced to show that fat soluble sitostanol esters could be added to fat blends to be used in the production of margarines in amounts of 10 or 20% of the total fat blend. The surprising physical properties of phytosterol esters enabling the fully or partly replacement of the nutritionally undesired triglyceride hardstock were not evident at the time of the invention described in U.S. Pat. No. 5,502,045. In the Example described in the patent the sitostanol ester was added to the existing fat blend and thereby it diluted both the liquid oil part and the hardstock of the fat blend. The surprising physical properties of phytosterol fatty acid esters contemplated in the present specification enabling substantial and even a total replacement of the conventional hardstock was therefore not obvious from the U.S. Pat. No. 5,502,045

Detailed Description Text (9):
Stanols are found in small amounts in nature in such products as wheat, rye, corn and triticale. They can also easily be produced by hydrogenation of natural sterol mixtures such as vegetable oil-based sterol mixtures or commercially available wood sterols. The plant sterols thus obtained can be converted into stanols by well known hydrogenation techniques such as those based on the use of a Pd/C catalyst in organic solvents. A wide variety of palladium catalysts and solvents, known to those skilled in the art, can be used to carry out the hydrogenation. It is obvious for those skilled in the art that sterols or stanols or their blends of other origins can be used to produce phytosterol esters as defined in the present invention.

Detailed Description Text (54):
The following data shows that sterol fatty acid esters can be used as a minor component of a blend with stanol fatty acid esters. The sterol or stanol esters are prepared with fatty acids derived from low erucic acid rapeseed oil. The blend is useful as a substitute for hardstock in fat-containing margarines, cheeses, spreads and the like. The following phytosterol esters and hardstocks were prepared and tested to determine their melting profile:

☐ 9. Document ID: US 6106886 A

L2: Entry 9 of 18 File: USPT Aug 22, 2000

DOCUMENT-IDENTIFIER: US 6106886 A
TITLE: Process for the production of stanol esters, and use thereof

Brief Summary Text (10):
Another advantage found with these preferred embodiments is that no solvents in the hardening step are needed since the phytosterol-esters are in a liquid form by themselves. Moreover, besides this method is solvent free and environmental friendly, and thus not requiring specific legal admissions, it is also more cost effective due to the fact that less raw materials, equipment and labour is required. Hence, a process in which all steps are carried out in full or substantial absence of a solvent can be achieved.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw Desc | Image

☐ 10. Document ID: US 6090401 A

L2: Entry 10 of 18 File: USPT Jul 18, 2000

DOCUMENT-IDENTIFIER: US 6090401 A
TITLE: Stable foam composition

CLAIMS:

16. The method of claim 11 wherein said pharmaceutically active ingredient is selected from the group consisting of phytosterols, phytostanols, esters of phytosterols, esters of phytostanols and oryzanol.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
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Terms	Documents
phytosterol ester	18

Display Format: KWIC | Change Format

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☐ 1. Document ID: US 6441206 B1

L3: Entry 1 of 4 File: USPT Aug 27, 2002

DOCUMENT-IDENTIFIER: US 6441206 B1
TITLE: Use of organic acid esters in dietary fat

Brief Summary Text (3):
The method here described also concerns a method to make phytostanol esters in accordance with patent claim 26.

Brief Summary Text (28):
The aim of the present invention is to synthesize new phytosterol and phytostanol esters, preferably .beta.-sitosterol and .beta.-sitostanol esters that have been modified so that the fat solubility of their derivatives has significantly increased in relation to free phytosterols and phytostanols. The aim of the invention is particularly to create tailor-made functional derivatives from phytosterols and phytostanols, that when dissolved in lipids can inhibit the absorption of cholesterol, and also increase the interaction between the hydrophobic lipid phase and water phase.

Detailed Description Text (111):
The phytosterol esters were added to the product dissolved in cooking oil; the reference-sample is according to the basic recipe.

CLAIMS:

6. A phytostanol ester formed with succinic acid, glutaric acid, ketoglutaric acid, tartaric acid, malic acid, citric acid, lactic acid or 3(R)-hydroxy-butyric acid, a phytostanol ester formed with an amino acid derivable from a protein, or a phytostanol ester formed with a derivative of these acids.

12. A method of preparing phytostanol derivatives comprising: preparing a phytosterol ester by esterification of a phytosterol with phytosterol hydroxy acid, keto acid, dicarboxylic acid or amino acid ester; hydrogenating said phytosterol ester in a concentrated ethanol or acetic acid solution to form a hydrogenation solution containing phytostanol derivatives.

13. A method according to claim 12, wherein the phytosterol ester is prepared with succinic acid, maleic acid, glutaric acid, keto glutaric acid, tartaric acid, malic acid, citric acid, lactic acid, 3(R)-hydroxy butyric acid or an amino acid derivable from proteins.

18. A dietary fat composition comprising: one or more of compounds selected from the group consisting of a phytosterol and/or phytostanol ester formed with succinic acid, glutaric acid, malic acid, tartaric acid, citric acid, lactic acid or 3(R)-hydroxy-butyric acid, phytosterol and/or phytostanol ester with an amino acid derivable from a protein, and phytosterol and/or phytostanol ester formed with a derivative of these acids; and dietary fat.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 2. Document ID: US 6171638 B1

L3: Entry 2 of 4 File: USPT Jan 9, 2001

DOCUMENT-IDENTIFIER: US 6171638 B1
TITLE: Production of isoflavone enriched fractions from soy protein extracts

Detailed Description Text (27):
The dry powder and added ingredient blended at 62 may also include food ingredients or the like. The food ingredient may be any in a group including sweetners, cocoa ingredients, starch, maltodextrin, animal protein, milk protein, soy flour, soy protein concentrate, plant and animal proteins, soy protein isolate, soy fiber, fluid lecithin, granular lecithin, polysaccharides, starches, fats and oils, phytosterols, phytosterol esters, phytostanols, phytostanol esters, mixed tocopherols, d,I-alpha tocopherol, sweetners and derivatives, lignans, catechins, carotenoids, d-alpha tocopherol, tocotrienols, and mixed thereof.

CLAIMS:

6. The process of claim 5, wherein the food ingredient is selected from the group consisting of sweetners, starch, maltodextrin, milk proteins, animal protein, soy flour, soy protein concentrate, soy protein isolate, and other edible proteins, soy fiber, fluid lecithin, granular lecithin, fats and oils, phytosterols, phytosterol esters, phytostanols, phytostanol esters, tocopherols, d,I-alpha tocopherol, d-alpha tocopherol, tocotrienols, lignans, catechins, carotenoids, and mixtures thereof.

9. The process of claim 8, wherein the at least one ingredient is selected from the group consisting of sweetners, starch, maltodextrin, milk protein, animal protein, soy flour, soy protein concentrate, soy protein isolate, and other edible proteins, soy fiber, fluid lecithin, granular lecithin, fats and oils, phytosterols, phytosterol esters, phytostanols, phytostanol esters, mixed tocopherols, d,I-alpha tocopherol, d-alpha tocopherol, lignans, catechins, carotenoids, tocotrienols and mixtures thereof.

61. The process of blending the product of claim 59 with a food ingredient selected from the group consisting of sweetners, starch, maltodextrin, milk proteins, animal protein, soy flour, soy protein concentrate, soy protein isolate, and other edible proteins, soy fiber, fluid lecithin, granular lecithin, fats and oil, phytosterols, phytosterol esters, phytostanols, phytostanol esters, tocopherals, d,I-alpha tocopherol, d-alpha tocopheral, tocotrienols, lignans, catechins, carotenoids, and mixtures thereof.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 3. Document ID: US 6090401 A

L3: Entry 3 of 4 File: USPT Jul 18, 2000

DOCUMENT-IDENTIFIER: US 6090401 A
TITLE: Stable foam composition

CLAIMS:

16. The method of claim 11 wherein said pharmaceutically active ingredient is selected from the group consisting of phytosterols, phytostanols, esters of phytosterols, esters of phytostanols and oryzanol.

☐ 4. Document ID: US 6087353 A

L3: Entry 4 of 4 File: USPT Jul 11, 2000

DOCUMENT-IDENTIFIER: US 6087353 A
TITLE: Phytosterol compositions and use thereof in foods, beverages, pharmaceuticals, nutraceuticals and the like

Brief Summary Text (22):
The present invention further comprises methods of making a composition suitable for incorporation into foods, beverages, pharmaceuticals, nutraceuticals and the like which comprises condensing a suitable aliphatic acid with a phytosterol to form a phytosterol ester and subsequently hydrogenating the phytosterol ester to form a hydrogenated phytosterol ester.

Brief Summary Text (31):
To form the phytosterol esters, one or more suitable aliphatic acids or their esters with low boiling alcohols are condensed with the phytosterols. A wide variety of aliphatic acids or their esters may be used successfully within the scope of the present invention and include all aliphatic acids consisting of one or more alkyl chains with one or more terminal carboxyl groups. These aliphatic acids may be natural or synthetic and are represented by the following chemical formulae:

Brief Summary Text (45):
To form a phytosterol ester in accordance with the present invention, the selected phytosterol and aliphatic acid or its ester with volatile alcohol are mixed together under reaction conditions to permit condensation of the phytosterol with the aliphatic acid to produce an ester. A most preferred method of preparing these esters which is widely used in the edible fat and oil industry is described in U.S. Pat. No. 5,502,045 (which is incorporated herein by reference). As no substances other than the free phytosterol, a fatty acid ester or mixture thereof and an interesterification catalyst like sodium ethylate are used, the technique is highly suitable for preparing products ultimately for human consumption. In overview, this preferred method, adapted for use within the present invention, comprises heating the phytosterol(s) with a vegetable oil fatty acid ester (preferably a methyl ester) at a temperature from 90-120.degree. C. and subsequently adding a suitable catalyst such as sodium ethylate. The catalyst is then removed/destroyed by any one of the techniques known in the art e.g. adding water and/or filtration/centrifugation.

Brief Summary Text (47):
Once the phytosterol ester is formed in accordance with the present invention it must then be hydrogenated. The conversion of the phytosterol ester to its saturated form

may be achieved by one of many known hydrogenation techniques (10, incorporated herein by reference) based on the use of Pd/C catalyst in organic solvents. Other suitable catalysts include platinum and Raney nickel. When this step is carried out under optimal conditions, only very small amounts of unsaturated sterol esters remain unconverted.

Brief Summary Text (59):
This system has several advantages as a delivery system for the oil-based composition of the present invention. Firstly, microemulsions tend to be created spontaneously, that is, without the degree of vigorous mixing required to form standard emulsions. From a commercial perspective, this simplifies the manufacturing process. Secondly, microemulsions may be sterilized using microfiltration techniques without breaking the microstructure due to the small diameter of the microdroplets. Thirdly, microemulsions are highly thermodynamically stable. Fourthly, microemulsions possess high solubilizing power which is particularly important as they allow for an increased solubilization of the poorly hydrosoluble phytostanol esters.

Brief Summary Text (110):
Compounds which are capable of opening up the water structure associated with hydrophobic (lipophilic) and other molecules are referred to as hydrotopes. These compounds may be used to enhance the aqueous solubility of poorly water-soluble substances such as phytosterols, phytostanols and their esters. Examples of hydrotopes include, inter alia, sodium benzoate, sodium hydroxybenzoates, sodium salicylate, nicotinamide, sodium nicotinate, sodium gentisate, gentisic acid ethanolamide, sodium toluates, sodium aminobenzoates, sodium anthranilate, sodium butylmonoglycolsulfate, resorcinol and the like.

CLAIMS:

11. A process of making a composition suitable for incorporation into foods, beverages, pharmaceuticals, nutraceuticals which comprises:

condensing an aliphatic acid with one or more phytosterols to form a phytosterol ester; and

hydrogenating the phytosterol ester to form a hydrogenated phytosterol ester.

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☐ 1. Document ID: US 6383514 B1

L5: Entry 1 of 2 File: USPT May 7, 2002

DOCUMENT-IDENTIFIER: US 6383514 B1
TITLE: Use of mixtures of active substances for the production of hypocholesterolemic agents

Abstract Text (1):
A hypocholesterolemic composition, for use in reducing serum cholesterol levels in warm-blooded organisms, the composition containing: (a) a phytostanol ester and (b) a tocopherol.

Brief Summary Text (2):
This invention relates to the use of mixtures of phytostanol esters and tocopherols for the production of preparations for reducing the serum cholesterol level of warm-blooded organisms.

Brief Summary Text (4):
Unfortunately, a disadvantage of phytostanol esters is that, normally, they can only be added to foods in small quantities because otherwise they are in danger of affecting the taste and/or consistency of foods. However, if the blood cholesterol level is to be lastingly influenced, relatively large quantities of phytostanol esters would have to be absorbed. The rate at which the substances reduce serum cholesterol is also in need of improvement. Accordingly, the problem addressed by the present invention was to remedy these deficiencies.

Brief Summary Text (7):
(a) phytostanol esters and

Brief Summary Text (10):
It has surprisingly been found that tocopherols, which have no hypocholesterolemic properties of their own, act as potentiating agents for phytostanol esters, i.e. accelerate the reduction of the serum cholesterol level in the presence of phytostanol esters. In addition, when encapsulated in gelatine, the active-substance mixtures can readily be taken in by mouth.

Brief Summary Text (11):
Phytostanol Esters

Brief Summary Text (13):
in which R.sup.1 CO is an aliphatic, linear or branched acyl group containing 2 to 22 carbon atoms and 0 and/or 1, 2 or 3 double bonds. Typical examples are acetic acid, propionic acid, butyric acid, valeric acid, caproic acid, caprylic acid, 2-ethyl hexanoic acid, capric acid, lauric acid, isotridecanoic acid, myristic acid, palmitic acid, palmitoleic acid, stearic acid, isostearic acid, oleic acid, elaidic acid, petroselic acid, linoleic acid, linolenic acid, elaeosteric acid, arachic acid, gadoleic acid, behenic acid and erucic acid and the technical mixtures thereof obtained, for example, in the pressure hydrolysis of natural fats and oils, in the reduction of aldehydes from Roelen's oxosynthesis or in the dimerization of unsaturated fatty acids. Technical fatty acids containing 12 to 18 carbon atoms, for example cocofatty acid, palm oil fatty acid, palm kernel oil fatty acid or tallow

fatty acid, are preferred. It is particularly preferred to use esters of .beta.-sitostanol with fatty acids containing 12 to 18 carbon atoms. These esters may be prepared both by direct esterification of the phytostanols with the fatty acids or by transesterification with fatty acid lower alkyl esters or triglycerides in the presence of suitable catalysts, for example sodium ethylate or, more particularly, enzymes [cf. EP-A2 0195311 (Yoshikawa)]. The corresponding phytostenol esters may also be initially prepared and then hydrogenated with the carbonylester group in tact.

Brief Summary Text (25):
The active-substance mixtures according to the invention may contain the phytostanol esters and the tocopherols in a ratio by weight of 99:1 to 1:99, preferably 90:10 to 10:90, more preferably 70:25 to 25:75 and most preferably 60:40 to 40:60, the only important requirement being to ensure that a quantity of component (a) sufficient to lower the blood cholesterol level is taken up through the use according to the invention. In one particular embodiment of the invention, the active-substance mixtures are encapsulated in known manner in gelatine, components (a) and (b) each being used in quantities of 0.1 to 50% by weight, preferably in quantities of 1 to 30% by weight, more preferably in quantities of 5 to 25% by weight and most preferably in quantities of 10 to 15% by weight, based on the weight of the gelatine capsules. The encapsulation of the phytostanol esters in gelatine--alone or in admixture with the potentiating agents--represents an advantageous embodiment for the oral administration of the active substances. The percentage content of the other potentiating agents (component c) may be from 1 to 10% by weight, based on the active-substance mixtures.

CLAIMS:

1. A hypocholesterolemic composition comprising:

(a) a phytostanol ester and

(b) a tocopherol.

2. The composition of claim 1 wherein the phytostanol ester is a .beta.-sitostanol ester.

11. A process for reducing serum cholesterol levels in warm-blooded organisms comprising administering an effective amount of a hypocholesterolemic composition to the warm-blooded organism, the hypocholesterolemic composition containing:

(a) a phytostanol ester and

(b) a tocopherol.

12. The process of claim 11 wherein the phytostanol ester is a .beta.-sitostanol ester.

☐ 2. Document ID: US 6087353 A

L5: Entry 2 of 2 File: USPT Jul 11, 2000

DOCUMENT-IDENTIFIER: US 6087353 A
TITLE: Phytosterol compositions and use thereof in foods, beverages, pharmaceuticals, nutraceuticals and the like

Brief Summary Text (16):
Although the Raision Patent and the Raision SA Patent both attempt to produce a phytostanol delivery system which is stable and effective, there are significant problems with the long-term stability of these esterified products due to the ultimate oxidation of the unsaturated fatty acid moiety.

Brief Summary Text (59):
This system has several advantages as a delivery system for the oil-based composition of the present invention. Firstly, microemulsions tend to be created spontaneously, that is, without the degree of vigorous mixing required to form standard emulsions. From a commercial perspective, this simplifies the manufacturing process. Secondly, microemulsions may be sterilized using microfiltration techniques without breaking the microstructure due to the small diameter of the microdroplets. Thirdly, microemulsions are highly thermodynamically stable. Fourthly, microemulsions possess high solubilizing power which is particularly important as they allow for an increased solubilization of the poorly hydrosoluble phytostanol esters.

Brief Summary Text (110):
Compounds which are capable of opening up the water structure associated with hydrophobic (lipophilic) and other molecules are referred to as hydrotopes. These compounds may be used to enhance the aqueous solubility of poorly water-soluble substances such as phytosterols, phytostanols and their esters. Examples of hydrotopes include, inter alia, sodium benzoate, sodium hydroxybenzoates, sodium salicylate, nicotinamide, sodium nicotinate, sodium gentisate, gentisic acid ethanolamide, sodium toluates, sodium aminobenzoates, sodium anthranilate, sodium butylmonoglycolsulfate, resorcinol and the like.

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☐ 1. Document ID: US 6352737 B1

L6: Entry 1 of 7 File: USPT Mar 5, 2002

DOCUMENT-IDENTIFIER: US 6352737 B1
TITLE: Use of nanoscale sterols and sterol esters

Brief Summary Text (3):
Another important property of phytosterols and, above all, of phytosterol esters is their hypocholesterolemic effect, i.e., their ability after oral ingestion, for example as a margarine additive, to significantly reduce cholesterol levels in the blood. This property was described as long ago as 1953 (Peterson, et al., J. Nutrit. Vol. 50, p. 191 (1953)). U.S. Pat. Nos. 3,089,939 and 3,203,862, in addition to German Patent Publication No. DE 20 35 069 (Procter & Gamble), point in the same direction. The active substances are normally added to cooking oils or edible oils and are then taken up through the food. However, the quantities used are generally small and are normally below 0.5% by weight, to prevent the edible oils from clouding or the sterols from precipitating when water is added. The incorporation of sitostanol esters in margarine, butter, mayonnaise, salad creams and the like to reduce the blood cholesterol content is proposed in International Patent Publication No. WO 92/19640 (Raision). Reference is also made in this connection to German Patent Publication No. DE-A1 197 00 796 (Henkel).

Brief Summary Text (10):
in which R.sup.1 CO is an aliphatic, linear or branched acyl group containing 2 to 22 carbon atoms and 0 and/or 1, 2 or 3 double bonds. Typical examples are acetic acid, propionic acid, butyric acid, valeric acid, caproic acid, caprylic acid, 2-ethyl hexanoic acid, capric acid, lauric acid, isotridecanoic acid, myristic acid, palmitic acid, palmitoleic acid, stearic acid, isostearic acid, oleic acid, elaidic acid, petroselic acid, linoleic acid, conjugated linoleic acid (CLA), linolenic acid, elaeosteric acid, arachic acid, gadoleic acid, behenic acid and erucic acid and the technical mixtures thereof obtained, for example, in the pressure hydrolysis of natural fats and oils, in the reduction of aldehydes from Roelen's oxosynthesis or as monomer fraction in the dimerization of unsaturated fatty acids. Technical fatty acids containing 12 to 18 carbon atoms, for example cocofatty acid, palm oil fatty acid, palm kernel oil fatty acid or tallow fatty acid, are preferred. It is particularly preferred to use esters of .beta.-sitosterol or .beta.-sitostanol with fatty acids containing 12 to 18 carbon atoms. These esters may be prepared both by direct esterification of the phytosterols with the fatty acids or by transesterification with fatty acid lower alkyl esters or triglycerides in the presence of suitable catalysts, for example sodium ethylate or, more particularly, enzymes, such as is described in European Patent Publication No. EP-A2 0195311 (Yoshikawa).

Detailed Description Paragraph Table (2):
TABLE 2 Hypocholesterolemic effect Radioactivity [%-rel.] After After After After After Ex. Phytosterol(ester) 3 h 6 h 12 h 24 h 48 h C1 .beta.-Sitostanol* 93 83 75 50 32 C2 .beta.-Sitostanyl stearate* 90 80 71 44 26 1 Nano-.beta.-sitostanol** 88 77 69 44 27 2 Nano-.beta.-sitostanyl 85 74 66 37 21 stearate*** *commercial products **acc. to Production Example 3 ***acc. to Production Example 5

CLAIMS:

3. The hypocholesteremic agent according to claim 1, wherein the at least one active substance is selected from the group consisting of nanoscale phytosterols and nanoscale phytosterol esters.

16. The edible composition according to claim 11, wherein the at least one active substance is selected from the group consisting of nanoscale phytosterols and nanoscale phytosterol esters.

☐ 2. Document ID: US 6316030 B1

L6: Entry 2 of 7 File: USPT Nov 13, 2001

DOCUMENT-IDENTIFIER: US 6316030 B1
TITLE: Use of nanoscale sterols and sterol esters

Brief Summary Text (11):
in which R.sup.1 CO is an aliphatic, linear or branched acyl group containing 2 to 22 carbon atoms and 0 and/or 1, 2 or 3 double bonds. Typical examples are acetic acid, propionic acid, butyric acid, valeric acid, caproic acid, caprylic acid, 2-ethyl hexanoic acid, capric acid, lauric acid, isotridecanoic acid, myristic acid, palmitic acid, palmitoleic acid, stearic acid, isostearic acid, oleic acid, elaidic acid, petroselic acid, linoleic acid, conjugated linoleic acid (CLA), linolenic acid, elaeosteric add, arachic acid, gadoleic acid, behenic acid and erucic acid and the technical mixtures thereof obtained, for example, in the pressure hydrolysis of natural fats and oils, in the reduction of aldehydes from Roelen's oxosynthesis or as monomer fraction in the dimerization of unsaturated fatty acids. Technical fatty acids containing 12 to 18 carbon atoms, for example cocofatty acid, palm oil fatty acid, palm kernel oil fatty acid or tallow fatty acid, are preferred. It is particularly preferred to use esters of .beta.-sitosterol or .beta.-sitostanol with fatty acids containing 12 to 18 carbon atoms. These esters may be prepared both by direct esterification of the phytosterols with the fatty acids or by transesterification with fatty acid lower alkyl esters or triglycerides in the presence of suitable catalysts, for example sodium ethylate or, more particularly, enzymes [cf. EP-A2 0195311 (Yoshikawa)].

Brief Summary Text (24):
(3) glycerol monoesters and diesters and sorbitan monoesters and diesters of saturated and unsaturated fatty acids containing 6 to 22 carbon atoms and ethylene oxide adducts thereof;

Brief Summary Text (65):
Besides the two groups of primary sun protection factors mentioned above, secondary sun protection factors of the antioxidant type may also be used. Secondary sun protection factors of the antioxidant type interrupt the photochemical reaction chain which is initiated when UV rays penetrate into the skin. Typical examples are amino acids (for example glycine, histidine, tyrosine, tryptophane) and derivatives thereof, imidazoles (for example urocanic acid) and derivatives thereof, peptides, such as D,L-carnosine, D-carnosine, L-carnosine and derivatives thereof (for example anserine), carotinoids, carotenes (for example .alpha.-carotene, .beta.-carotene, lycopene) and derivatives thereof, chlorogenic acid and derivatives thereof, liponic acid and derivatives thereof (for example dihydroliponic acid), aurothioglucose, propylthiouracil and other thiols (for example thioredoxine, glutathione, cysteine, cystine, cystamine and glycosyl, N-acetyl, methyl, ethyl, propyl, amyl, butyl and

lauryl, palmitoyl, oleyl, y-linoleyl, cholesteryl and glyceryl esters thereof) and their salts, dilaurylthiodipropionate, distearylthiodipropionate, thiodipropionic acid and derivatives thereof (esters, ethers, peptides, lipids, nucleotides, nucleosides and salts) and sulfoximine compounds (for example butionine sulfoximines, homocysteine sulfoximine, butionine sulfones, penta-, hexa- and hepta-thionine sulfoximine) in very small compatible dosages (for example pmole to .mu.mole/kg) also (metal) chelators (for example .alpha.-hydroxyfatty acids, palmitic acid, phytic acid, lactoferrine), .alpha.-hydroxy acids (for example citric acid, lactic acid, malic acid), humic acid, bile acid, bile extracts, bilirubin, biliverdin, EDTA, EGTA and derivatives thereof, unsaturated fatty acids and derivatives thereof (for example .gamma.-linolenic acid, linoleic acid, oleic acid), folic acid and derivatives thereof, ubiquinone and ubiquinol and derivatives thereof, vitamin C and derivatives thereof (for example ascorbyl palmitate, Mg ascorbyl phosphate, ascorbyl acetate), tocopherols and derivatives (for example vitamin E acetate), vitamin A and derivatives (vitamin A palmitate) and coniferyl benzoate of benzoin resin, rutinic acid and derivatives thereof, .alpha.-glycosyl rutin, ferulic acid, furfurylidene glucitol, carnosine, butyl hydroxytoluene, butyl hydroxyanisole, nordihydroguaiac resin acid, nordihydroguaiaretic acid, trihydroxybutyrophenone, uric acid and derivatives thereof, mannose and derivatives thereof, Superoxid-Dismutase, zinc and derivatives thereof (for example ZnO, ZnSO.sub.4), selenium and derivatives thereof (for example selenium methionine), stilbenes and derivatives thereof (for example stilbene oxide, trans-stilbene oxide) and derivatives of these active substances suitable for the purposes of the invention (salts, esters, ethers, sugars, nucleotides, nucleosides, peptides and lipids).

CLAIMS:

2. A. The composition of claim 1 wherein the nanoscale sterols and nanoscale sterol esters are phytosterols and their ester derivatives.

12. The process of claim 11 wherein the nanoscale sterols and nanoscale sterol esters are phytosterols and their ester derivatives.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
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☐ 3. Document ID: US 6162483 A

L6: Entry 3 of 7 File: USPT Dec 19, 2000

DOCUMENT-IDENTIFIER: US 6162483 A
TITLE: Fat compositions for use in food

Abstract Text (1):
Fatty acid esters, such as the unsaturated fatty acid esters of sterols and/or stanols, are used as a replacement for a substantial portion or all of the undesirable saturated and trans-unsaturated fats used as structure giving hardstocks in edible foods such as margarines mayonnaise, cooking oils, cheeses, butter and shortening. Because of the similarity in the crystallinity and physical properties of the esters to those of the undesirable hardstock fats, the substitution or replacement contributes favorably to the flavor, texture and other sensory properties of the foods. Only the fatty acid portion of the phytosterol esters defined herein as texturizing agent is digested or absorbed with the sterol part being unabsorbable, thereby resulting in a reduction in total caloric uptake. Furthermore, the phytosterol fatty acid esters reduce the absorption of both dietary and biliary cholesterol from the digestive tract, thereby lowering the blood serum cholesterol level, especially the LDL-cholesterol.

Brief Summary Text (3):
Fats constitute a substantial portion of the total calories in the human diet. In many individuals, fats contribute as much as 40% of the calories consumed. Fat is an important source of energy and contains essential fatty acids, such as linoleic and linolenic acids. Fat is also a carrier for fat-soluble vitamins and other nutrients. In addition to its functional properties, fat is often used to improve the overall quality of foods, including color, texture, structure, flavor and mouthfeel. However, in recent decades, investigations have revealed a correlation between high consumption of fats and increased rates of diseases such as atherosclerosis, coronary artery disease and obesity. Furthermore, it has been observed that saturated fatty acids and trans-unsaturated fatty acids are a greater contributor to diseases such as coronary arterial disease than other types of fats. Thus, over the years, the amount of fat-derived calories in the human diet, as well as the proportion of saturated to unsaturated fats consumed by the population, has changed significantly. The consumption of fats derived from vegetable oils that are rich in cis-unsaturated fatty acids has increased markedly over the years. However, in a number of food products, the complete substitution of saturated fats with unsaturated fats leads to other problems.

Brief Summary Text (6):
EPO Patent Publication No. 4070658A1 attempts to reduce the percentage of hardstock of edible spreads to a minimum, representing less than 10% by weight of fully hydrogenated fat with a low trans-unsaturated fatty acid content. The remaining fat is derived from liquid oil and is largely unsaturated.

Brief Summary Text (13):
This invention is based on the surprising finding that stanol and sterol fatty acid esters, such as phytosterol esters, or their blends form crystal networks with similar properties as those of conventional hardstock triglycerides. This finding makes it possible to use these texturizing agents fully or partly as replacements for the conventional hardstock in fat blends to be used in fat-containing products, where the crystallizing fat of the hardstock is of prime importance to the overall sensoric quality.

Brief Summary Text (14):
A conventional fat blend comprises a liquid oil component and a solid fat component comprising a conventional hardstock. The present invention relates to a fat blend and an edible food containing such, including a reduced level of a conventional hardstock rich in absorbable saturated or a trans-unsaturated fat, wherein the solid fat component is composed of either fully a phytosterol ester or ester blend, defined herein as a texturizing agent, or of a blend of said texturizing agent and conventional hardstock. The obtained solid fat of the invention shows similar physical properties as conventional hardstocks and builds up in the final food product a crystal network with similar properties as the conventional hardstock.

Brief Summary Text (16):
The phytosterol esters defined herein as texturizing agents comprise unsaturated and saturated fatty acid esters of sterols or stanols as well as mixtures thereof. The term phytosterol is intended to mean saturated and unsaturated sterol alcohols and their blends derived from plants (plant sterols), as well as synthetically produced sterol alcohols and their blends having properties that replicate those of naturally occurring alcohols. These sterol alcohols are characterized by a common polycyclic steroid nucleus comprising a 17 carbon atom ring system, a side chain and a hydroxyl group. The nucleus is either saturated, wherein the sterol alcohol is referred to as a stanol, or unsaturated, wherein the sterol alcohol is referred to as a sterol. For purposes of the present invention, sterol is understood to mean a single sterol or blends of sterols, and stanol is understood to mean a singl stanol or blends of stanols.

Brief Summary Text (18):
Campestanol is referred to as the peak obtained by routine gas liquid chromatography containing campestanol and its epimer 24-methyl cholestanol, derived from the saturation of brassicasterol or 22,23-dihydrobrassicasterol. Preferably, the stanol fatty acid ester is a sitostanol fatty acid ester, or a mixture of the sitostanol

fatty acid ester and a campestanol fatty acid ester. Alternatively, certain sterol fatty acid esters or their blends may be used provided their melting point and other physical characteristics replicate those of the conventional hardstock. The stanol or sterol fatty acid ester can be prepared by the esterification of a free stanol or a free sterol or a blend of these with a saturated or unsaturated fatty acid. Fatty acid, for purposes of this invention, is understood to mean a single fatty acid or a blend of two or more fatty acids. Likewise, fatty acid ester of sterol or stanol is understood to mean a single fatty acid ester or a blend of fatty acid esters. The fatty acid typically has between 4 and 24, but preferably between 16 and 20, carbon groups in the fatty acid chain. The texturizing agent preferably has a crystalline structure or matrix at room temperature, and behaves surprisingly like a conventional crystallizing fat in food manufacturing processes such as the production of margarine, spreads and spreadable cheeses.

Brief Summary Text (20):
According to the invention it was surprisingly found that esters of stanol and/or sterol fatty acids even totally can replace the hardstock in conventional fat blends to be used in the preparation of foods like margarines, spreads and spreadable cheeses, giving a crystal network with similar physical and melt-down properties in the mouth. It is obvious for those skilled in the art that the solid fat component disclosed in the present specification can be used in any food, where a fat blend containing crystallizing fats is needed to obtain desirable sensoric and physical properties in the final product. The triglyceride component of conventional hardstock is basically composed of saturated and trans-unsaturated fatty acids. Since these fatty acids have a linear structure, they are easily packed into the crystal lattice during crystallization. The stanol and/or sterol esters contemplated in this specification comprise on the other hand mostly unsaturated fatty acids, which are bent or folded and would therefor not be expected to produce a crystal network with similar melting properties as conventionally used triglyceride hardstocks. Furthermore, conventional triglyceride hardstocks produce stable .beta.'-crystals. .beta.'-crystals are small needle-like crystals that grow together (sintring) to produce the crystal network. One important feature of this crystal network is the very big overall crystal surface, which enables the liquid oil and water droplets to be retained. The fact that the stanol and/or sterol esters according to this invention build up a crystal network with similar properties as that of conventional hardstock triglycerides was therefore a total surprise.

Brief Summary Text (21):
For the purpose of this invention, solid fat is understood to mean the non-liquid part of the fat blend, crystallizing to form a crystal network and giving the end product the desired structural and sensoric properties. In this specification the solid fat is either composed wholly of a texturizing agent defined herein as a phytosterol ester or ester blends or of a blend of said texturizing agent and conventional hardstock. The composition and physical properties of the solid fat are tailor-made to give similar physical properties as conventional triglyceride-based hardstocks. The phytosterol esters can be prepared e. g. by the method described later in Example 1 of this specification. Conventional hardstock fats may be used as part of the solid fat and those skilled in the art are familiar with different compositions of usable hardstocks. It is therefore obvious for a person skilled in the art how to prepare the solid fat of the invention by practicing the teachings of this invention.

Brief Summary Text (22):
In addition to replacing part or all of the hardstock of a conventional fat blend, the invention furthermore includes a process for improving the fatty acid composition of a fat blend to be used in the final food product. Normally, the fatty acids needed to obtain the desired physical properties of the texturizing agent are derived from liquid vegetable oils rich in unsaturated fatty acids. When the conventionally used harmful substituent is replaced by the texturizing agent of the present invention, harmful fatty acids such as saturated and trans-unsaturated fatty acids are partially or entirely replaced by mainly nutritionally desired cis-unsaturated fatty acids. Preferably at least 60 weight-% of the fatty acids in the fat blend including the stanol/sterol ester are derived from vegetable oils. These fatty acids are contained in the liquid oil part as well as in the texturizing agent.

Brief Summary Text (23):
The invention furthermore includes a process for preserving the texture of a food product containing a fat blend, while reducing the amount of the absorbable fat in the product. Much of the absorbable harmful saturated and trans-unsaturated fatty acids are contained in the so-called hardstock, typically added to a food product to improve the texture and other sensory properties thereof. The process comprises substituting, for at least a portion of the hardstock, a texturizing agent consisting of fatty acid esters of sterols, fatty acid esters of stanols or mixtures of these. The hardstock, which is rich in saturated and trans-unsaturated fatty acids and contains a high level of triglycerides, is replaced in whole or in part with the texturizing agent. The ratio between texturizing agent and solid fat is preferably at least 0.4, more preferably at least 0.5. Even more preferably are ratios of at least 0.6, most preferably at least 0.7. Most desirably, there is no hardstock in the fat blend. The texturizing agent preferably comprises a stanol fatty acid ester optionally containing different amounts of a sterol fatty acid ester, preferably up to as much as 30%. In addition the texturizing agent can even comprise up to 100% of sterol fatty acid ester after proper optimization of the fatty acid composition. The stanol and/or sterol fatty acid ester used in the process can be prepared by the esterification of a stanol and/or sterol and a fatty acid in the presence of a food-grade catalyst. The process typically involves interesterification of the stanol and a fatty acid ester or a fatty acid ester blend.

Brief Summary Text (24):
The invention furthermore comprises a process for producing a food product such as a fat blend containing a reduced level of absorbable fat, the process comprising utilizing the solid fat of the invention in the food product, wherein a portion or all of the conventional nutritionally undesired hardstock in the composition is replaced by a texturizing agent consisting of fatty acid esters of sterols, fatty acid esters of stanols or blends of these. Desirable texturizing agents useful in the invention comprise wood and vegetable oil stanol esters which are blended with liquid vegetable oils such as rapeseed oil. In one embodiment, the fat blend comprises between about 29% and about 35% of wood stanol ester, about 54% and about 75% of rapeseed oil and about 3% and about 17% of hardstock rich in saturated and/or trans-unsaturated fatty acids. Desirably, the texture and melting characteristics of the solid fat comprising at least 40% by weight of the texturizing agent, result in a product having sensory characteristics similar to products based on fat blends with conventional hardstock, but with markedly improved fatty acid composition from a nutritional point of view.

Brief Summary Text (25):
The invention also relates to a solid fat component useful in edible food, the solid fat component comprising a texturizing agent and optionally some bardstock. The composition may be incorporated into a fat blend which also contains a liquid vegetable oil preferably rich in unsaturated fatty acids. The solid fat component comprises preferably at least 40% by weight of texturizing agent. The solid fat component may contain a minor amount of a hardstock rich in saturated and/or trans-unsaturated fats. The texturizing agent is a sterol fatty acid ester or a stanol fatty acid ester or a mixture of the two. The ester preferably is prepared by esterification of a stanol and/or a sterol derived from wood or vegetable oil, but can also be prepared from sterol and stanol blends derived from other sources. Additionally, the sterol or stanol blend can be obtained by blending sterols and stanols derived from different sources. A liquid vegetable oil like rapeseed oil (LEAR) having a very low content of saturated fatty acids is a preferred source of fatty acids useful for the esterification and also for blending with the stanol ester or sterol ester. Other saturated or unsaturated fatty acids which may be used are derivable from edible vegetable oils or fats, preferentially vegetable liquid oils, such as sunflower oil, soybean oil, corn oil and their mixtures. It is obvious to those skilled in the art that any liquid edible oil or blends of two or more of these can be used as a source of fatty acids for the esterification. The most desirable solid fat component has a melting profile wherein most of the crystallized material has fully melted in the temperature range of between about 37.degree. C. and about 40.degree. C. as measured by differential scanning calorimetry after a directed crystallization procedure. In some applications a texturizing agent melting at higher temperatures might be desired. In these cases edible hard fats, such as coconut oil, palm oil, partially hydrogenated vegetable oils or milk fat, can be used as a source

of fatty acids for the esterification.

Brief Summary Text (28):
Another object of the present invention is to reduce the amount of saturated fats and trans-unsaturated fatty acids from edible foods without sacrifice of texture and other desirable characteristics of the foods.

Brief Summary Text (29):
Still another object of the present invention is the replacement of hardstock containing harmful saturated and trans-unsaturated fatty acids in foods and food additives with a healthier phytosterol fatty acid ester based substance that can be customized to mimic the texture and other sensory characteristics of the hardstock which it replaces.

Brief Summary Text (30):
Another object of the present invention is a food product in which some or all of the hardstock is replaced with a texturizing agent comprising phytosterol fatty acid esters in a fat blend containing unsaturated fatty acids derived from liquid vegetable oils as the sole absorbable fat.

Brief Summary Text (31):
Yet another object of the present invention is to replace saturated and trans-unsaturated fatty acids in edible foods with a more healthful substitute having a secondary effect of blocking absorption of cholesterol from the intestinal tract and reducing the amount of absorbable fat.

Detailed Description Text (4):
The advantages of using the stanol or sterol fatty acid esters for this purpose is that their physical properties can be tailor-made by changing the fatty acid composition. This is achieved by selecting a fatty acid which contributes the requisite melting point profile to the phytosterol ester. The carbon chain length of the fatty acid affects the melting point of the ester, i.e. melting points decrease with increasing molecular weight of the fatty acid until a minimum is reached at the C14-C16 region after which the melting points increase. Also a contributing factor is the degree of saturation or unsaturation of the fatty acid, with a greater degree of saturation being accompanied by a higher melting point.

Detailed Description Text (7):
It should be noted that the fat blends containing phytosterol ester used for lowering the cholesterol level disclosed in Example 5 of U.S. Pat. No. 5,502,045 were produced to show that fat soluble sitostanol esters could be added to fat blends to be used in the production of margarines in amounts of 10 or 20% of the total fat blend. The surprising physical properties of phytosterol esters enabling the fully or partly replacement of the nutritionally undesired triglyceride hardstock were not evident at the time of the invention described in U.S. Pat. No. 5,502,045. In the Example described in the patent the sitostanol ester was added to the existing fat blend and thereby it diluted both the liquid oil part and the hardstock of the fat blend. The surprising physical properties of phytosterol fatty acid esters contemplated in the present specification enabling substantial and even a total replacement of the conventional hardstock was therefore not obvious from the U.S. Pat. No. 5,502,045

Detailed Description Text (9):
Stanols are found in small amounts in nature in such products as wheat, rye, corn and triticale. They can also easily be produced by hydrogenation of natural sterol mixtures such as vegetable oil-based sterol mixtures or commercially available wood sterols. The plant sterols thus obtained can be converted into stanols by well known hydrogenation techniques such as those based on the use of a Pd/C catalyst in organic solvents. A wide variety of palladium catalysts and solvents, known to those skilled in the art, can be used to carry out the hydrogenation. It is obvious for those skilled in the art that sterols or stanols or their blends of other origins can be used to produce phytosterol esters as defined in the present invention.

Detailed Description Text (11):
The fatty acids and fatty acid esters useful in the present invention are selected from the group consisting of saturated straight chain fatty acids, saturated branched

chain fatty acids and unsaturated fatty acids. The carbon chain length of the fatty acid useful in the present invention is typically between 2 and 24. However, preferably, the fatty acid or blends of fatty acid useful in the present invention are selected so that the melting point, texture and other sensory characteristics of the sterol fatty acid ester, the stanol fatty acid ester or their blends closely replicates the corresponding properties of the hardstock that is being replaced. Particularly suitable in the present invention are fatty acids having an average carbon chain length between 12 and 24, more specifically between about 16 and 20, and preferably about 18.

Detailed Description Text (51):
The data in Table II clearly shows that by optimizing the fatty acid composition of the wood and vegetable oil sterol fatty acid esters, the melting characteristics of the blends make them suitable as replacements for components in the hardstock rich in saturated and trans-unsaturated fatty acids to impart texture and other sensory properties to the foods. Although these sterol esters contain small amounts of stanol esters it is obvious that sterol ester blends based entirely on unsaturated sterols, after proper optimizing of the fatty acid composition, also will obtain desirable melting characteristics making them suitable for use as texturizing agents.

Detailed Description Text (54):
The following data shows that sterol fatty acid esters can be used as a minor component of a blend with stanol fatty acid esters. The sterol or stanol esters are prepared with fatty acids derived from low erucic acid rapeseed oil. The blend is useful as a substitute for hardstock in fat-containing margarines, cheeses, spreads and the like. The following phytosterol esters and hardstocks were prepared and tested to determine their melting profile:

Detailed Description Text (75):
It is further contemplated that the present invention can be practiced by blending together two or more sterol esters to provide a substituent which can be blended with liquid vegetable oils rich in unsaturated fatty acid to replace most or all of the saturated or trans-unsaturated fatty acid in the fat blend. Blends of a wood sterol fatty acid containing about 85% sterol as campesterol or sitosterol and the remainder being stanol, is reacted with various fatty acids to produce the sterol ester. Several of these esters are blended together according to the following formulations to give products having favorable temperature profiles to serve as replacements for the harmful fats in hardstock.

Detailed Description Text (104):
It is obvious from a reading of the foregoing discussion that the present invention yields one or more distinct advantages over the use of fatty components rich in saturated or trans-unsaturated fatty acids. In the first place, the substitution of a portion of the harmful fatty acids with unsaturated absorbable fatty acid esters of stanols and sterols blended with liquid vegetable oils rich in unsaturated fatty acids provides a definite nutritional advantage to the user. Furthermore, less than 40% comprises absorbable fatty acids while the sterol is unabsorbed, and thus contributing no calories to the diet. Further, it is noted that the sterol or stanol esters serve to block the absorption of both biliary and endogenic cholesterol into the blood serum. Yet another advantage is that the absorbable fat in the solid fat component can comprise a high percentage of unsaturated fatty acids and a low percentage of harmful saturated and trans fatty acids. Where the entire hardstock is replaced by the texturizing agent the highest reduction in absorbable fat is achieved resulting in a marked decrease of the harmful saturated and trans-unsaturated fatty acids with an improved fatty acid composition high in desirable unsaturated fatty acids.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

☐ 4. Document ID: US 6106886 A

L6: Entry 4 of 7 File: USPT Aug 22, 2000

DOCUMENT-IDENTIFIER: US 6106886 A
TITLE: Process for the production of stanol esters, and use thereof

Abstract Text (1):
The invention concerns a process for the preparation of stanol fatty acid esters mixtures by interesterification of stanol fatty acid esters starting material, of which at least 50% of the fatty acid groups are saturated, with fatty acid mixtures containing at least 35%, and preferably at least 45%, of poly unsaturated fatty acid (PUFA) groups, and wherein preferably the hardening of sterol fatty acid esters. The sterol fatty acid esters are preferably prepared by the esterification of phytosterols with a fatty acid ester mixture comprising at least 70% of C18 fatty acids, all steps can be carried out in the absence of a solvent. Also claimed are food products comprising the stanol fatty acid esters obtained by the process.

Brief Summary Text (8):
In this invention, a process is proposed for the preparation of stanol fatty acid esters having any desired fatty acid groups, the preparation comprising the interesterification of stanol fatty acid esters with a source for one or more fatty acid moieties of a desired composition. Such a desired phytostanol fatty acid mixture can be obtained by interesterification with sources for fatty acid moieties containing high amounts (>35%, preferably >45%, more preferred >60%) of poly unsaturated fatty acid (PUFA) moieties. In a more preferred embodiment, a process for preparation of stanol fatty acid esters is proposed by the hardening of phytosterol fatty acid esters, followed by the interesterification of the so obtained stanol esters with sources for fatty acid moieties, preferably with the high PUFA fatty acid contents indicated above. By this method, stanol esters which will largely comprise saturated fatty acid groups, for example by hardening of phytosterol fatty acid esters, can be used to obtain a stanol ester mixture comprising fatty acid groups of a particularly desired composition. The use of a high PUFA mixture provides the additional advantage that it is considered that these stanol fatty acid esters have a very good solubility and blood cholesterol lowering efficacy in the body.

Brief Summary Text (10):
Another advantage found with these preferred embodiments is that no solvents in the hardening step are needed since the phytosterol-esters are in a liquid form by themselves. Moreover, besides this method is solvent free and environmental friendly, and thus not requiring specific legal admissions, it is also more cost effective due to the fact that less raw materials, equipment and labour is required. Hence, a process in which all steps are carried out in full or substantial absence of a solvent can be achieved.

CLAIMS:

1. Process for the preparation of stanol fatty acid esters mixtures comprising interesterifying stanol fatty acid esters starting material, of which at least 50% of the fatty acid groups are saturated, with a source for one or more fatty acid moieties containing at least 35% of poly unsaturated fatty acid (PUFA) groups.

☐ 5. Document ID: US 6087353 A

L6: Entry 5 of 7 File: USPT Jul 11, 2000

DOCUMENT-IDENTIFIER: US 6087353 A
TITLE: Phytosterol compositions and use thereof in foods, beverages, pharmaceuticals, nutraceuticals and the like

Brief Summary Text (16):
Although the Raision Patent and the Raision SA Patent both attempt to produce a phytostanol delivery system which is stable and effective, there are significant problems with the long-term stability of these esterified products due to the ultimate oxidation of the unsaturated fatty acid moiety.

Brief Summary Text (22):
The present invention further comprises methods of making a composition suitable for incorporation into foods, beverages, pharmaceuticals, nutraceuticals and the like which comprises condensing a suitable aliphatic acid with a phytosterol to form a phytosterol ester and subsequently hydrogenating the phytosterol ester to form a hydrogenated phytosterol ester.

Brief Summary Text (31):
To form the phytosterol esters, one or more suitable aliphatic acids or their esters with low boiling alcohols are condensed with the phytosterols. A wide variety of aliphatic acids or their esters may be used successfully within the scope of the present invention and include all aliphatic acids consisting of one or more alkyl chains with one or more terminal carboxyl groups. These aliphatic acids may be natural or synthetic and are represented by the following chemical formulae:

Brief Summary Text (45):
To form a phytosterol ester in accordance with the present invention, the selected phytosterol and aliphatic acid or its ester with volatile alcohol are mixed together under reaction conditions to permit condensation of the phytosterol with the aliphatic acid to produce an ester. A most preferred method of preparing these esters which is widely used in the edible fat and oil industry is described in U.S. Pat. No. 5,502,045 (which is incorporated herein by reference). As no substances other than the free phytosterol, a fatty acid ester or mixture thereof and an interesterification catalyst like sodium ethylate are used, the technique is highly suitable for preparing products ultimately for human consumption. In overview, this preferred method, adapted for use within the present invention, comprises heating the phytosterol(s) with a vegetable oil fatty acid ester (preferably a methyl ester) at a temperature from 90-120.degree. C. and subsequently adding a suitable catalyst such as sodium ethylate. The catalyst is then removed/destroyed by any one of the techniques known in the art e.g. adding water and/or filtration/centrifugation.

Brief Summary Text (47):
Once the phytosterol ester is formed in accordance with the present invention it must then be hydrogenated. The conversion of the phytosterol ester to its saturated form may be achieved by one of many known hydrogenation techniques (10, incorporated herein by reference) based on the use of Pd/C catalyst in organic solvents. Other suitable catalysts include platinum and Raney nickel. When this step is carried out under optimal conditions, only very small amounts of unsaturated sterol esters remain unconverted.

CLAIMS:

11. A process of making a composition suitable for incorporation into foods, beverages, pharmaceuticals, nutraceuticals which comprises:

condensing an aliphatic acid with one or more phytosterols to form a phytosterol ester; and

hydrogenating the phytosterol ester to form a hydrogenated phytosterol ester.

☐ 6. Document ID: US 6031118 A

L6: Entry 6 of 7 File: USPT Feb 29, 2000

DOCUMENT-IDENTIFIER: US 6031118 A
TITLE: Stanol ester composition and production thereof

Brief Summary Text (7):
It has now been found that phytostanol fatty acid esters can be suitably prepared by the esterification of phytosterols, followed by hardening of the so formed phytosterol fatty acid esters. This method has the advantage that no solvents in the hardening step are needed since the phytosterol-esters are in a liquid form by themselves. Moreover, besides this method is solvent free and environmentally friendly, and thus not requiring specific legal admissions, it is also more cost effective due to the fact that less raw materials, equipment and labour is required. In another embodiment, the stanol fatty acid esters are prepared by hardening phytosterol fatty acid esters or a mixture thereof.

Brief Summary Text (15):
These saturated fatty acid stanol esters were found to have stronger structuring properties than stanolesters mixtures comprising mainly mono- or poly-unsaturated fatty acids, due to their higher melting points. By using the so produced stanolesters with saturated fatty acids, the amount of hardstock required to make a spreadable product out of above mentioned liquid oils can be more reduced than with stanolesters mixtures comprising mainly mono- or poly-unsaturated fatty acids, thereby potentially optimizing the amount of PUFA rich glycerides in the product further, and thereby compensating the saturated fatty acid part of the stanol ester mixture applied in the product.

Brief Summary Text (27):
If a fat blend is used, it is preferred that it comprises at least 30%, and more preferred at least 45% of poly-unsaturated fatty acids, based on the total weight amount of the fat in the fat based food product. So, a strong effect on the cholesterol lowering effect is obtained if use is made of the stanol (saturated) fatty acid esters as set forth in this application in a food product in which a fat blend comprising at least 30 wt. % of PUFA rich triglycerides is used.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
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☐ 7. Document ID: US 5616552 A

L6: Entry 7 of 7 File: USPT Apr 1, 1997

DOCUMENT-IDENTIFIER: US 5616552 A
TITLE: Detergent composition comprising N-acylthreonine salt

Brief Summary Text (15):
The acyl group of the N-acylthreonine salt is an acyl residue of saturated or

unsaturated fatty acid having 8-22 carbon atoms. Suitable acyl groups include acyl residues of fatty acids of a single composition such as lauric acid, myristic acid, palmitic acid, stearic acid and oleic acid and also acyl residues of the mixed fatty acids obtained from nature such as coconut oil fatty acids, tallow fatty acids, hydrogenated tallow fatty acids, castor oil fatty acids, olive oil fatty acids and palm oil fatty acids as well as those of the fatty acids (including branched ones) obtained through synthesis.

Brief Summary Text (18):
The higher fatty acid salt of the component (B) of the detergent composition of the present invention is a salt with a linear or branched and saturated or unsaturated fatty acid having 8-22 carbon atoms. Preferred examples are the salts with lauric acid, myristic acid, palmitic acid, stearic acid, coconut oil fatty acid, hydrogenated tallow fatty acid, behenic acid and oleic acid. Examples of the basic component for such a salt are alkali metals such as sodium and potassium; alkali earth metals such as magnesium and calcium; organic amines such as monoethanolamine, diethanolamine, triethanolamine, 2-amino-2-methyl-1-propanol and 2-amino-2-methyl-1,3-propanediol; basic amino acids such as lysine, ornithine and arginine; and ammonia. Those basic components may be used either solely or jointly by combining two or more of them.

Brief Summary Text (26):
In the anionic surface-active agent of an N-acylamino carboxylate type, the acyl group is an acyl residue of saturated or unsaturated fatty acid having 8-22 carbon atoms. Examples of it are acyl residues of fatty acids of a single composition such as lauric acid, myristic acid, palmitic acid, stearic acid and oleic acid and also are acyl residues of the mixed fatty acids obtained from nature such as coconut oil fatty acids, tallow fatty acids, hydrogenated tallow fatty acids, castor oil fatty acids, olive oil fatty acids and palm oil fatty acids as well as of the fatty acids (including branched ones) obtained through synthesis. Examples of the aminocarboxylic acid binding therewith are acidic amino acids such as glutamic acid, aspartic acid, cysteic acid and homocysteic acid; neutral amino acids such as glycine, alanine, valine, leucine, isoleucine, phenylalanine, tryptophane, sarcosine, beta-alanine, gamma-aminobutyric acid, epsilon-aminocaproic acid, serine, homoserine, tyrosine, proline, hydroxyproline, cystine, cysteine and methionine; and basic amino acids such as lysine, ornithine and arginine. With respect to those acylaminocarboxylic acids, any optical isomer or racemic compound may be used.

Brief Summary Text (32):
Examples of the above-mentioned anionic surface-active agent of an organic sulfonate of monobasic acid type are C.sub.8-22 linear or branched alkyl or alkenyl sufonates, alkyl benzenesulfonates having a linear or branched alkyl group of 10-16 carbon atoms and N-acylsulfonates or O-acylsulfonates in which the acyl group is a linear or branched and saturated or unsaturated fatty acid residue having 8-22 carbon atoms.

Brief Summary Text (66):
There is no particular limitation in terms of the form of the detergent in the detergent composition of the present invention and any of the forms of liquid, paste, gel, solid, powder, etc. may be adopted. The pH of such a detergent is 5-9 or, preferably, 6-8. In the case of the detergent composition of the present invention in which N-acrylthreonine salt is used, the foam property is not deteriorated, unlike the composition using other N-acyl neutral amino acid salt such as N-acylalanine salt or N-acylglycine salt, even if the pH is 7 or less and, therefore, a product with little irritation to the skin can be prepared. Other components which are common for use in detergent compositions may be added to the detergent composition of the present invention so far as they do not inhibit the effect of the present invention. Examples of such other common components for the detergent compositions are polyhydric alcohols such as diglycerol, octanediol, maltitol, diethylene glycol, polyethylene glycol, ethylene glycol, propylene glycol, dipropylene glycol, polypropylene glycol, isopropylene glycol, pentyaerythritol, glucose, trehalose, fructose, 1,3-butylene glycol, glycerol and sorbitol; moisturizing agents such as sodium DL-pyrrolidonecarboxylate and sodium lactate; emulsifiers such as glycerol monostearate, sorbitan monopalmitate, sorbitan monostearate, sorbitan monooleate, sorbitan monosesquioleate, sorbitan monolaurate, polyglycerol monostearate, polyoxyethylene cetyl ether, polyoxyethylene stearyl ether, polyoxyethylene sorbitan

monolaurate, diglycerol monostearate, polyethylene glycol monostearate, polyethylene glycol monooleate, polyethylene glycol monolaurate, polyethylene glycol distearate, polyethylene glycol dioleate, polyethylene glycol dilaurate, polyoxyethylene oleyl ether, polyoxyethylene lauryl ether, polyoxyethylene nonylphenyl ether, polyoxyethylene octylphenyl ether, polyoxyethylene sorbitol bees wax, polyoxyethylene sorbitan monostearate, polyoxyethyene sorbitan monooleate, polyoxyethylene sorbitan monolaurate and ethylene glycol monostearate; triglycerides such as avocado oil, almond oil, olive oil, cacao butter, beef tallow, sesame oil, wheat germ oil, safflower oil, shea butter, turtle oil, tsubaki oil, persic oil, castor oil, grape oil, macademia nut oil, mink oil, egg yolk oil, wood wax, coconut oil, rose hip oil, soybean oil, cotton seed oil and hydrogenated oil; wax such as orange raffy oil, carnauba wax, candelilla wax, whale wax, jojoba oil, monta wax, bees wax and lanolin; hydrocarbons such as liquid paraffin, paraffin, vaseline, ceresin, microcrystalline wax, solid paraffin, squalane and olefin oligomers; higher alcohols such as lauryl alcohol, cetyl alcohol, cetostearyl alcohol, stearyl alcohol, oleyl alcohol, behenyl alcohol, lanolin alcohol, hydrogenated lanolin alcohol, hexyldecanol, octyldecanol, isostearyl alcohol, jojoba alcohol and decyltetradecanol; sterols such as cholesterol, dihydroxycholesterol and phytosterol; esters such as oleyl oleate, ethyl linolate, isopropyl myristate, isopropyl lanolate, hexyl laurate, myristyl myristate, cetyl myristate, isopropyl palmitate, stearyl stearate, octyldodecyl myristate, decyl oleate, octyldodecyl oleate, hexyldecyl dimethyloctanoate, cetyl isooctanoate, cetyl palmitate, glycerol trimyristate, glycerol tris(caprylcaprate), propylene glycol dioleate, glycerol triisostearate, glycerol triisooctanoate, cetyl lactate, myristyl lactate, diisostearyl malate, cholesteryl stearate, cholesteryl isostearate, cholesteryl 12-hydroxystearate, glyceryl pyroglutamate oleate, di(cholesteryl, behenyl or octyldodeyl alcohol) N-lauroyl-L-glutamate and triglycerol 2-ethylhexanoate; polymers such as methylcellulose, hydroxyethylcellulose, hydroxypropylcellulose, ethylcellulose, nitrocellulose, sodium carboxymethylcellulose, carboxyvinyl polymer, polyvinyl methyl ether, polyvinyl alcohol, crystalline cellulose, arabic gum, tragacanth gum, guar gum, locust bean gum, karaya gum, iris moss, queens seed, gelatin, shellac, rosin, casein, sodium alginate, ester gum, polyvinylpyrrolidone, sodium polyacrylate, polyamide resin, silicone oil, chitin, partially deacetylated chitin, hydrolyzed collagen, polyaspartic acid, sodium polyglutamate and xanthan gum; antiseptics/antifungals such as cresol derivatives and paraben derivatives; pharmaceuticals and effective materials such as antiinflammatory agents, crude drugs, vitamins, hair growth promoters, whitening agents, UV absorbers and hormones; cosmetic materials such as pH-adjusting agents, feel-improving agents, perfatty agents, inorganic salts, amino acids, pearling agents, viscosity-adjusting agents, perfumes, dyes, softeners and mitigating agents; chelating agents such as ethylenediaminetetraacetic acid, citric acid, maleic acid, succinic acid, ascorbic acid, cephalin, gluconic acid, saccharinic acid, hexametaphos-phoric acid, 1-hydroxyethane-1,1-diphosphonic acid, dihydoxyethylglycine and salts thereof; and animal and plant extracts such as placenta extract, licorice extract, hamamelis solution, sponge cucumber solution, elastin, aloe extract and chamomilla extract.

Terms	Documents
L2 and (unsaturated fatty acid)	7

WEST

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Search Results - Record(s) 1 through 3 of 3 returned.

☐ 1. Document ID: US 20020160990 A1

L12: Entry 1 of 3 File: PGPB Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020160990
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020160990 A1

TITLE: PHYTOSTEROL AND/OR PHYTOSTANOL DERIVATIVES

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20020055493 A1

L12: Entry 2 of 3 File: PGPB May 9, 2002

PGPUB-DOCUMENT-NUMBER: 20020055493
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020055493 A1

TITLE: Phytosterol and/or phytostanol derivatives

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 3. Document ID: WO 200061694 A1 KR 278194 B KR 2000012176 A AU 9957634 A

L12: Entry 3 of 3 File: DWPI Oct 19, 2000

DERWENT-ACC-NO: 2000-665120
DERWENT-WEEK: 200207
COPYRIGHT 2003 DERWENT INFORMATION LTD
TITLE: Method for manufacturing fat-soluble phytosterol or phytostanol esters of unsaturated fatty acids which inhibit the absorption of cholesterol, and foodstuffs containing the esters

INVENTOR: KIM, G S; CHUNG, D ; KIM, K ; NOH, S

PRIORITY-DATA: 1999KR-0012965 (April 13, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200061694 A1	October 19, 2000	E	019	C09J009/00
KR 278194 B	January 15, 2001		000	C07C401/00
KR 2000012176 A	March 6, 2000		000	C07C401/00
AU 9957634 A	November 14, 2000		000	C09J009/00

INT-CL (IPC): A23 L 1/24; C07 C 401/00; C09 J 9/00

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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Terms	Documents
L8 and (unsaturated fatty acid)	3

Display Format: - Change Format

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Search Results - Record(s) 1 through 3 of 3 returned.

☐ 1. Document ID: US 20020160990 A1

L12: Entry 1 of 3 File: PGPB Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020160990
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020160990 A1

TITLE: PHYTOSTEROL AND/OR PHYTOSTANOL DERIVATIVES

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

☐ 2. Document ID: US 20020055493 A1

L12: Entry 2 of 3 File: PGPB May 9, 2002

PGPUB-DOCUMENT-NUMBER: 20020055493
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020055493 A1

TITLE: Phytosterol and/or phytostanol derivatives

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

☐ 3. Document ID: WO 200061694 A1 KR 278194 B KR 2000012176 A AU 9957634 A

L12: Entry 3 of 3 File: DWPI Oct 19, 2000

DERWENT-ACC-NO: 2000-665120
DERWENT-WEEK: 200207
COPYRIGHT 2003 DERWENT INFORMATION LTD
TITLE: Method for manufacturing fat-soluble phytosterol or phytostanol esters of unsaturated fatty acids which inhibit the absorption of cholesterol, and foodstuffs containing the esters

INVENTOR: KIM, G S; CHUNG, D ; KIM, K ; NOH, S

PRIORITY-DATA: 1999KR-0012965 (April 13, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200061694 A1	October 19, 2000	E	019	C09J009/00
KR 278194 B	January 15, 2001		000	C07C401/00
KR 2000012176 A	March 6, 2000		000	C07C401/00
AU 9957634 A	November 14, 2000		000	C09J009/00

INT-CL (IPC): A23 L 1/24; C07 C 401/00; C09 J 9/00

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

Generate Collection | Print

Terms	Documents
L8 and (unsaturated fatty acid)	3

Display Format: - Change Format

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Generate Collection | Print

Search Results - Record(s) 1 through 5 of 5 returned.

☐ 1. Document ID: US 20020160990 A1

L11: Entry 1 of 5 File: PGPB Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020160990
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020160990 A1

TITLE: PHYTOSTEROL AND/OR PHYTOSTANOL DERIVATIVES

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20020055493 A1

L11: Entry 2 of 5 File: PGPB May 9, 2002

PGPUB-DOCUMENT-NUMBER: 20020055493
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020055493 A1

TITLE: Phytosterol and/or phytostanol derivatives

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 3. Document ID: WO 9819556 A1

L11: Entry 3 of 5 File: EPAB May 14, 1998

PUB-NO: WO009819556A1
DOCUMENT-IDENTIFIER: WO 9819556 A1
TITLE: TEXTURIZING COMPOSITIONS FOR USE IN FAT BLENDS IN FOOD

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 4. Document ID: EP 1227816 A1 WO 200130359 A1 SE 9903915 A AU 200113211 A SE 517769 C2

L11: Entry 4 of 5 File: DWPI Aug 7, 2002

DERWENT-ACC-NO: 2001-328607
DERWENT-WEEK: 200259

COPYRIGHT 2003 DERWENT INFORMATION LTD
TITLE: Composition for lowering blood lipid and cholesterol levels, is easy and cheap to prepare and includes, e.g. sterols, stanols, hydrolyzed fibers and fatty acid esters

INVENTOR: SJOEBERG, K

PRIORITY-DATA: 1999SE-0003915 (October 29, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 1227816 A1	August 7, 2002	E	000	A61K031/575
WO 200130359 A1	May 3, 2001	E	011	A61K031/575
SE 9903915 A	April 30, 2001		000	A61K031/575
AU 200113211 A	May 8, 2001		000	A61K031/575
SE 517769 C2	July 16, 2002		000	A61K031/575

INT-CL (IPC): A23 L 1/30; A23 L 1/308; A61 K 31/21; A61 K 31/22; A61 K 31/232; A61 K 31/575; A61 K 31/718; A61 K 35/78; A61 K 47/36; A61 P 3/06

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 5. Document ID: JP 08059439 A JP 2699265 B2

L11: Entry 5 of 5 File: DWPI Mar 5, 1996

DERWENT-ACC-NO: 1996-184663
DERWENT-WEEK: 199808
COPYRIGHT 2003 DERWENT INFORMATION LTD
TITLE: Cleansing liquid for the scalp - contains fatty oil from animal mane and antioxidant, removing excess hair lipid and preventing hair loss.

PRIORITY-DATA: 1994JP-0219479 (August 22, 1994)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 08059439 A	March 5, 1996		005	A61K007/06
JP 2699265 B2	January 19, 1998		005	A61K007/06

INT-CL (IPC): A61 K 7/06; A61 K 31/23; A61 K 31/355; A61 K 31/575; A61 K 35/12

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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Terms	Documents
L9 and (unsaturated fatty acid)	5

Display Format: - Change Format

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Search Results - Record(s) 1 through 5 of 5 returned.

6441206
6383514
6171638
6090401
6087353

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Terms	Documents
phytostanol ester	5

Display Format: PNO | Change Format

Previous Page Next Page

DOCUMENT NUMBER: 116:213322
TITLE: Removal of sterols and saturated fatty acids from fats with activated carbon
INVENTOR(S): Athnasios, Albert K.; Templeman, Gareth J.
PATENT ASSIGNEE(S): Nabisco Brands, Inc., USA
SOURCE: U.S., 19 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5091117	A	19920225	US 1990-509230	19900416

AB Activated charcoal is used as an adsorbent to remove sterols and satd. fatty acids from fats and oils. These compds. are removed either by using the adsorbent directly on the fat or on a solvent that has been used to ext. these compds. from the fat. An app. for this extn. is described. A column. of activated C 500 g (prepd. by heating charcoal to 130.degree. for 48 h) equilibrated with n-hexane was prepd. with the ends sealed with silica gel. Refined **fish oil** 50 g was eluted from the column with n-hexane 6, di-Et ether 2, methylene chloride 4, and anhyd. methanol 2 L. Most of the oil eluted with methylene chloride and methanol; anal. showed that the **cholesterol** content of these fractions had been lowered by 98.65 and 99.2% resp. There was no significant loss of .omega.-3 fatty acids.

L22 ANSWER 12 OF 22 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1991:60641 CAPLUS
DOCUMENT NUMBER: 114:60641
TITLE: Qualitative characteristics of household margarine for cooking
AUTHOR(S): Kohiyama, Masatake; Maruyama, Takenori; Kanematsu, Hiromu; Niiya, Isao
CORPORATE SOURCE: Japan Inst. Oils Fats, Other Foods Insp., Found, Tokyo, 103, Japan
SOURCE: Yukagaku (1990), 39(12), 1050-5
CODEN: YKGKAM; ISSN: 0513-398X
DOCUMENT TYPE: Journal
LANGUAGE: Japanese

AB Chem. and phys. parameters of 12 brands of margarine (vegetable fat type, 6; milk fat blend type, 2; and vegetable-animal mixed fat type, 4 brands) were evaluated. Anal. results for sterols and fatty acid compn. showed brands of the vegetable-animal mixed fat type to contain hydrogenated **fish oil** and the other types, hydrogenated vegetable oils. Six brands contained low-erucic rapeseed oil. The content of total tocopherols in the household margarine was 16.8 .apprx. 40.8 mg/100 g (av. 27.6 mg/100 g), less than the amt. previously reported for margarine for spreading. Tocopherol, listed on the package labels for 8 brands, including all vegetable-animal mixed fat type, might have been added as an antioxidant, since the .gamma.-form was present in a much greater amt. than the .alpha.-form in all of the brands. In an oven test at 60.degree., the oxidative stability of the milk fat blend margarine was quite good, but the peroxide value of the margarine, whose percentage of 18:2 fatty acid exceeded 15%, rose more rapidly than that of any other type. Prooxidant metals, such as iron, copper, or nickel, were present in only trace amts. and were not related to increase in peroxide values. From the curves of hydrogenation index and solid fat content, the margarines tested were arranged with respect to hardness in the order of vegetable fat type < vegetable-animal mixed fat type < milk fat blend type, particularly in the lower temp. region. Cooking margarine oiled-off with relative difficulty even at room temp. (.apprx.20.degree.).

```
=> s fish oil
        113405 FISH
        634893 OIL
L16       7216 FISH OIL
                 (FISH(W)OIL)

=> s l16 and unsaturated fatty acid
         49277 UNSATURATED
        308317 FATTY
       3454055 ACID
           836 UNSATURATED FATTY ACID
                 (UNSATURATED(W)FATTY(W)ACID)
L17         38 L16 AND UNSATURATED FATTY ACID

=> s l17 and food
        250937 FOOD
L18          5 L17 AND FOOD

=> s l17 and cholesterol
        133607 CHOLESTEROL
L19          1 L17 AND CHOLESTEROL

=> d s l16 and sterol
'S' IS NOT A VALID FORMAT FOR FILE 'CAPLUS'
'AND' IS NOT A VALID FORMAT FOR FILE 'CAPLUS'
'STEROL' IS NOT A VALID FORMAT FOR FILE 'CAPLUS'

The following are valid formats:

ABS --------- GI and AB
ALL --------- BIB, AB, IND, RE
APPS -------- AI, PRAI
BIB --------- AN, plus Bibliographic Data and PI table (default)
CAN --------- List of CA abstract numbers without answer numbers
CBIB -------- AN, plus Compressed Bibliographic Data
DALL -------- ALL, delimited (end of each field identified)
DMAX -------- MAX, delimited for post-processing
FAM --------- AN, PI and PRAI in table, plus Patent Family data
FBIB -------- AN, BIB, plus Patent FAM
IND --------- Indexing data
IPC --------- International Patent Classifications
MAX --------- ALL, plus Patent FAM, RE
PATS -------- PI, SO
SAM --------- CC, SX, TI, ST, IT
SCAN -------- CC, SX, TI, ST, IT (random display, no answer numbers;
              SCAN must be entered on the same line as the DISPLAY,
              e.g., D SCAN or DISPLAY SCAN)
STD --------- BIB, IPC, and NCL

IABS -------- ABS, indented with text labels
IALL -------- ALL, indented with text labels
IBIB -------- BIB, indented with text labels
IMAX -------- MAX, indented with text labels
ISTD -------- STD, indented with text labels

OBIB -------- AN, plus Bibliographic Data (original)
OIBIB ------- OBIB, indented with text labels

SBIB -------- BIB, no citations
SIBIB ------- IBIB, no citations

HIT --------- Fields containing hit terms
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HITIND ------ IC, ICA, ICI, NCL, CC and index field (ST and IT)
containing hit terms
HITRN ------- HIT RN and its text modification
HITSTR ------ HIT RN, its text modification, its CA index name, and
its structure diagram
HITSEQ ------ HIT RN, its text modification, its CA index name, its
structure diagram, plus NTE and SEQ fields
FHITSTR ----- First HIT RN, its text modification, its CA index name, and
its structure diagram
FHITSEQ ----- First HIT RN, its text modification, its CA index name, its
structure diagram, plus NTE and SEQ fields
KWIC -------- Hit term plus 20 words on either side
OCC --------- Number of occurrence of hit term and field in which it occurs

To display a particular field or fields, enter the display field codes. For a list of the display field codes, enter HELP DFIELDS at an arrow prompt (=>). Examples of formats include: TI; TI,AU; BIB,ST; TI,IND; TI,SO. You may specify the format fields in any order and the information will be displayed in the same order as the format specification.

All of the formats (except for SAM, SCAN, HIT, HITIND, HITRN, HITSTR, FHITSTR, HITSEQ, FHITSEQ, KWIC, and OCC) may be used with DISPLAY ACC to view a specified Accession Number.
ENTER DISPLAY FORMAT (BIB):end

=> s l16 and sterol
20272 STEROL
L20 37 L16 AND STEROL

=> s l20 and food
250937 FOOD
L21 6 L20 AND FOOD

=> s l20 and cholesterol
133607 CHOLESTEROL
L22 22 L20 AND CHOLESTEROL

=> d l21 1-6 ibib hitstr abs

L21 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 2001:319732 CAPLUS
DOCUMENT NUMBER: 134:316161
TITLE: Cholesterol lowering and blood lipids lowering composition based on phytosterols
INVENTOR(S): Sjoeberg, Kjell
PATENT ASSIGNEE(S): Triple Crown AB, Swed.
SOURCE: PCT Int. Appl., 11 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001030359	A1	20010503	WO 2000-SE2100	20001027

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

SE 9903915	A	20010430	SE 1999-3915	19991029
SE 517769	C2	20020716		
EP 1227816	A1	20020807	EP 2000-975114	20001027

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL

PRIORITY APPLN. INFO.: SE 1999-3915 A 19991029
WO 2000-SE2100 W 20001027

AB The present invention is a compn. contg. cholesterol- and blood lipids-lowering components such as phytosterols in combination with unsatd. fatty acids or esters, short chain fatty acids or esters and/or hydrolyzed flour contg. .beta.-glucan and amylodextrin; **food** contg. such a compn. and a method for manufg. of such a compn. are also described. For example, 500 g of **fish oil**, 100 g of short-chain fatty acids, 150 g of glycerol, and 300 g sterols were mixed and transesterified. The compn. obtained can be used for mixing into different **food**, encapsulated or tableted.

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1999:722849 CAPLUS
DOCUMENT NUMBER: 131:309994
TITLE: Phytosterol fatty acid ester compositions for **food** use
INVENTOR(S): Wester, Ingmar; Ekblom, Jari
PATENT ASSIGNEE(S): Raisio Benecol Oy, Finland
SOURCE: PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9956558	A1	19991111	WO 1999-FI379	19990506

W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

FI 9801011	A	19991107	FI 1998-1011	19980506
AU 9939349	A1	19991123	AU 1999-39349	19990506
EP 1075191	A1	20010214	EP 1999-922220	19990506

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI

BR 9910248	A	20011002	BR 1999-10248	19990506
JP 2002513079	T2	20020508	JP 2000-546604	19990506

PRIORITY APPLN. INFO.: FI 1998-1011 A 19980506
WO 1999-FI379 W 19990506

AB A **sterol** and(or) stanol (preferably sitostanol and campestanol) fatty acid ester compn. comprises a blend of less than 5-7% satd. fatty acids and more than 50% polyunsatd. fatty acids (PUFA). The esters are produced preferentially with fatty acids from high-PUFA vegetable oils, but also **fish oil**-derived PUFA or blends of vegetable and **fish oil** PUFA may be used. The **sterol**

and(or) stanol esters are preferentially produced by catalytic esterification. Uses in salad oil, cooking oil, etc., are indicated. Thus, stanol fatty acid esters based on soybean oil fatty acids are obtained by first hydrogenating a tall oil **sterol** blend, blending the stanols with soybean oil Me esters, and esterifying in the presence of sodium ethoxide catalyst.

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1998:460305 CAPLUS
DOCUMENT NUMBER: 129:244359
TITLE: Qualitative characteristics of sweetened type fat spreads
AUTHOR(S): Murakami, Chiaki; Kinoshita, Youko; Oota, Chiho; Maruyama, Takenori; Niiya, Isao
CORPORATE SOURCE: Japan Institute Oils Fats, Other Foods Inspection, Tokyo, 103-0007, Japan
SOURCE: Seikatsu Eisei (1998), 42(3), 93-96
CODEN: SEEIAY; ISSN: 0582-4176
PUBLISHER: Osaka Seikatsu Eisei Kyokai
DOCUMENT TYPE: Journal
LANGUAGE: Japanese

AB The qual. characteristics of recently produced sweetened processed fat spreads were studied by measuring the chem. parameters of forty brands. 1. Regarding nutritional components, the spreads were found to contain approx. 35-75% lipid, 10-30% water, 5-35% carbohydrate and <5% protein. Butylhydroxyanisole, dibutylhydroxytoluene, sorbic acid and benzoic acid were not found. 2. The most commonly used sugars were sucrose, glucose, fructose and maltose. Twenty-eight brands used a combination of sucrose, glucose and fructose and seven a combination of sucrose, glucose, fructose and maltose. 3. Anal. results on fatty acid compn. and **sterol** compn. indicated that the most commonly used oils were hardened **fish oil**, rapeseed oil contg. rapeseed hardened oil, and palm oil.

L21 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1997:733812 CAPLUS
DOCUMENT NUMBER: 128:34176
TITLE: The effect of vegetable oils with various ratios of polyunsaturated .omega.-3 and .omega.-6 fatty acids (PUFA) on the expression of **food** anaphylaxis, liver cytochrome P-450 system and metabolism of 17-oxycorticosteroids in guinea pigs
AUTHOR(S): Malikova, N. A.; Krzhechkovskaya, V. V.; Marokko, I. N.; Mazo, V. K.
CORPORATE SOURCE: Nutrition Institute, Russian Academy of Medical Sciences, Moscow, Russia
SOURCE: Voprosy Pitaniya (1995), (4), 13-16
CODEN: VPITAR; ISSN: 0042-8833
PUBLISHER: AO "Nutritek"
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB The effects of diets contg. sunflower oil, **fish oil**, and their 1:1 mix were studied. The ratios of .omega.-6 to .omega.-3 PUFA in the diets were 64.0, 0.13, and 2.64. The severity of dietary anaphylaxis to chicken ovalbumin was significantly reduced by sunflower oil. Simultaneously a marked increase of the ratios P-450V to P-450L and b5 to P 450 and a redn. of the hexenal sleep time were found. The amt. of excreted polar 17-OCS was also decreased in animals fed sunflower oil. Probable mechanisms of the hypoallergenic action of dietary sunflower oil may involve reorganization of the liver cytochrome P 450 system and alterations in 17-OCS metab.

L21 ANSWER 5 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1987:154995 CAPLUS
DOCUMENT NUMBER: 106:154995
TITLE: Raw materials used in the production of edible fats and a study of commercial products
AUTHOR(S): Carpio, Cecilia; Parreno, Miguel
CORPORATE SOURCE: Esc. Politec. Nac., Fac. Ing. Quim., Ecuador
SOURCE: Politecnica (1985), 10(4), 123-50
CODEN: POTQAY; ISSN: 0032-3055
DOCUMENT TYPE: Journal
LANGUAGE: Spanish
AB Comparative phys. and chem. analyses were made of an imported hog fat product (Choice White Grease, extensively used in Ecuador for the prodn. of edible fats) and various other animal fats (lard, organ fat, and bone fat of hogs; beef, lamb, and chicken fat; **fish oil**). The fatty acid compn. of the white grease was very similar to bone fat. Cholesterol [57-88-5], the only **sterol**, was present at unacceptably high levels for human consumption in the white grease and in **fish oil**. Nevertheless, of 8 com. samples of edible fat examd., compositional data suggested that 4 included **fish oil** and 3 contained the white grease.

L21 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1986:167216 CAPLUS
DOCUMENT NUMBER: 104:167216
TITLE: Health **food** containing unsaturated fatty acid glycerides and plant sterols
INVENTOR(S): Sugiyama, Hiroshi; Sano, Michihiko
PATENT ASSIGNEE(S): Asahi Denka Kogyo K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 61015647	A2	19860123	JP 1984-135874	19840630

AB A health **food** contains highly unsatd. fatty acid glycerides and plant sterols. The digestion of the anticholesteremic glycerides is improved by plant sterols. Thus, 10 parts of a **fish oil** contg. 12% eicosapentaenoic acid, 8 parts soybean **sterol**, and 0.1 part natural vitamin E were mixed, homogenized and encapsulated with gelatin.

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L21 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 2001:319732 CAPLUS
DOCUMENT NUMBER: 134:316161
TITLE: Cholesterol lowering and blood lipids lowering composition based on phytosterols
INVENTOR(S): Sjoeberg, Kjell
PATENT ASSIGNEE(S): Triple Crown AB, Swed.
SOURCE: PCT Int. Appl., 11 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001030359	A1	20010503	WO 2000-SE2100	20001027
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
SE 9903915	A	20010430	SE 1999-3915	19991029
SE 517769	C2	20020716		
EP 1227816	A1	20020807	EP 2000-975114	20001027
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				

PRIORITY APPLN. INFO.: SE 1999-3915 A 19991029
WO 2000-SE2100 W 20001027

AB The present invention is a compn. contg. cholesterol- and blood lipids-lowering components such as phytosterols in combination with unsatd. fatty acids or esters, short chain fatty acids or esters and/or hydrolyzed flour contg. .beta.-glucan and amylodextrin; **food** contg. such a compn. and a method for manufg. of such a compn. are also described. For example, 500 g of **fish oil**, 100 g of short-chain fatty acids, 150 g of glycerol, and 300 g sterols were mixed and transesterified. The compn. obtained can be used for mixing into different **food**, encapsulated or tableted.

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1999:722849 CAPLUS
DOCUMENT NUMBER: 131:309994
TITLE: Phytosterol fatty acid ester compositions for **food** use
INVENTOR(S): Wester, Ingmar; Ekblom, Jari
PATENT ASSIGNEE(S): Raisio Benecol Oy, Finland
SOURCE: PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9956558	A1	19991111	WO 1999-FI379	19990506
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
FI 9801011	A	19991107	FI 1998-1011	19980506
AU 9939349	A1	19991123	AU 1999-39349	19990506
EP 1075191	A1	20010214	EP 1999-922220	19990506
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				

BR 9910248 A 20011002 BR 1999-10248 19990506
JP 2002513079 T2 20020508 JP 2000-546604 19990506
PRIORITY APPLN. INFO.: FI 1998-1011 A 19980506
WO 1999-FI379 W 19990506

AB A **sterol** and(or) stanol (preferably sitostanol and campestanol) fatty acid ester compn. comprises a blend of less than 5-7% satd. fatty acids and more than 50% polyunsatd. fatty acids (PUFA). The esters are produced preferentially with fatty acids from high-PUFA vegetable oils, but also **fish oil**-derived PUFA or blends of vegetable and **fish oil** PUFA may be used. The **sterol** and(or) stanol esters are preferentially produced by catalytic esterification. Uses in salad oil, cooking oil, etc., are indicated. Thus, stanol fatty acid esters based on soybean oil fatty acids are obtained by first hydrogenating a tall oil **sterol** blend, blending the stanols with soybean oil Me esters, and esterifying in the presence of sodium ethoxide catalyst.

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L21 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1998:460305 CAPLUS
DOCUMENT NUMBER: 129:244359
TITLE: Qualitative characteristics of sweetened type fat spreads
AUTHOR(S): Murakami, Chiaki; Kinoshita, Youko; Oota, Chiho; Maruyama, Takenori; Niiya, Isao
CORPORATE SOURCE: Japan Institute Oils Fats, Other Foods Inspection, Tokyo, 103-0007, Japan
SOURCE: Seikatsu Eisei (1998), 42(3), 93-96
CODEN: SEEIAY; ISSN: 0582-4176
PUBLISHER: Osaka Seikatsu Eisei Kyokai
DOCUMENT TYPE: Journal
LANGUAGE: Japanese

AB The qual. characteristics of recently produced sweetened processed fat spreads were studied by measuring the chem. parameters of forty brands. 1. Regarding nutritional components, the spreads were found to contain approx. 35-75% lipid, 10-30% water, 5-35% carbohydrate and <5% protein. Butylhydroxyanisole, dibutylhydroxytoluene, sorbic acid and benzoic acid were not found. 2. The most commonly used sugars were sucrose, glucose, fructose and maltose. Twenty-eight brands used a combination of sucrose, glucose and fructose and seven a combination of sucrose, glucose, fructose and maltose. 3. Anal. results on fatty acid compn. and **sterol** compn. indicated that the most commonly used oils were hardened **fish oil**, rapeseed oil contg. rapeseed hardened oil, and palm oil.

L21 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1997:733812 CAPLUS
DOCUMENT NUMBER: 128:34176
TITLE: The effect of vegetable oils with various ratios of polyunsaturated .omega.-3 and .omega.-6 fatty acids (PUFA) on the expression of **food** anaphylaxis, liver cytochrome P-450 system and metabolism of 17-oxycorticosteroids in guinea pigs
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